

# THE WORKS OF JOHN DEE

MODERNIZATIONS OF HIS MAIN  
MATHEMATICAL MASTERPIECES

© 2010 by Jim Egan. All Rights reserved.

ISBN\_10:

ISBN-13:

LCCN:

Published by  
Cosmopolite Press  
153 Mill Street  
Newport, Rhode Island 02840

Visit *John Dee Tower.com* for more information.

Printed in the United States of America



# THE WORKS OF JOHN DEE

MODERNIZATIONS OF HIS MAIN  
MATHEMATICAL MASTERPIECES

BY  
JIM EGAN

COSMOPOLITE PRESS  
NEWPORT, RHODE ISLAND



"CITIZEN OF THE WORLD"  
(COSMOPOLITE, IS A WORD COINED  
BY JOHN DEE, FROM THE GREEK  
WORDS COSMOS MEANING "WORLD"  
AND POLITÈS MEANING "CITIZEN")

*Dedication*

To John Dee,  
who had the courage to share  
his wisdom even during tumultuous times.

## Table of Contents

page

1	1558 (and 1568) Propaedeumata Aphoristica (in Latin)
19	Propaedeumata Aphoristica (translated into English)
51	1564 Monas Hieroglyphica (in Latin)
67	Monas Hieroglyphica (translated into English)
123	1570 Preface to Euclid (in Elizabethan English)
145	Preface to Euclid (in Modern English)
199	1573 A Certain Essence of Parallax
205	1577 General and Rare Memorials pertaining to the Art of Navigation
209	1580 Map of North America
211	1583 Calendar Treatise
215	Calendar Treatise (in Modern English)
225	1592 Compendious Rehearsal
239	1594 Discourse Apologetical
245	Discourse Apologetical (in Modern English)



## Introduction

These translations and modernizations of Dee's major works are organized chronologically. However, I recommend reading the 1570 *Preface to Euclid* first. It was written for the common Elibethan gives a good feel for Dee's voice.

Then look over his works on Time and Navigation from the 1570's and 1580's. From 1575-1583 Dee taught navigational techniques to England's top explorers. He was also busy trying to convince the Queen to settle colonies in North America and to Reform the Calendar. (She took his advice, but both efforts ultimately failed for other reasons)

From 1583 to 1590, he was on the continent with his family, from Poland to King Rudolph's Court in Prague.

In the 1590's, he wrote two lengthy appeals to the Crown to be granted a rectorship and for a life devoted to the service of England. In these autobiographical texts (the *Compendious Rehearsal* and *Discourse Apologetical*), Dee lists the books and treatises he has written, providing valuable insight into his career.

Finally, return to the beginning of the book. The *Propaedeumata Aphoristica* (or Preparatory Aphorisms) are meant to lay a groundwork for the *Monas Hieroglyphica*. Read the first 20 Aphorisms and browse the other 100. Don't be concerned if you don't follow all the astronomical geometry. Much of is not directly applicable to the Monas (but he has tucked important clues every here and there).

Then to be really confounded, read the *Monas Hieroglyphica*. You may not understand what it means, but you will certainly sense how important it was to Dee.





[Title page of the 1558 *Propaedeumata Aphoristica*]





# Propædeumata Aphoristica

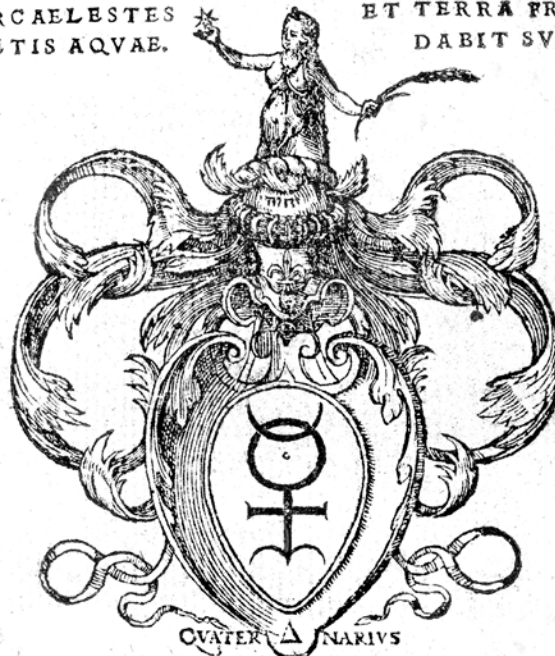
IOANNIS DEE, LONDINENSIS,

De Præstantioribus quibusdam

*Naturæ Virtutibus.*

SVPERCAELESTES  
RORETIS AQVAE.

ET TERRA FRVCTV  
DABIT SVVM.



INTERNARIO CONQVIESCENS.

Londini.

ANNO, M.D.LXVIII.

[Title page of the second edition 1568 *Propædeumata Aphoristica*]

CLARISSIMO VIRO D. GERARDO MERCATORI, R. PELMVNDANO, PHILOSOPHO ET MATHEMATICO illustri: ac amico suo longè charissimo IOANNES DEE LONDINENSIS. S. D. P.



NDECIMVS iam

agitur annus (humanissime, doctissimeq; mi GERARDE) ab illo, quo nostris ego felicis Academicis, omnibusq; nostrarū scholarum, in artium septem (liberalium dictarū) professione, percursus ordinibus sine subere (vt in prouerbio est. nare: & in Regiones transmarinas cæperam peregrinari: ad ipsos inuestigandos fontes, à quibus hac nostra ætate, plurimi ad nos optimarum quarumq; Artium deducebātur canalculi: & cum illis vitam ducere familiarem, quorum vel leuissimus quisq; vnus diei in scribendo, labor, nobis antea domi desiderantibus, per anni ferè vnus spatium, satis (ad intelligendum) faceret negotii. Atq; in isto primæ meæ peregrinationis inchoato cursu, quoniam in te, primum omnium, Louanii tum agentem, incidere, maximo mihi summi Numinis obtigit fauore: & ex tuis mecum disceptationibus, tum primas tū altissimas vt radices ageret tota mea peregrina philosophandi ratio: Nūc proinde Ego esse æquū censo, rationiq; maxime consentanū, vt iam primò peregrinantes, laborū etiam tu meorum primitias, iure tibi vendices meritissimo. Et maxime, cum mutæ nostræ amicitiae, familiaritatisq; cōsuetudo ea erat, toto vt triennio, vix totos tres simul dies, alter alterius lubens careret aspectu: & ea vtriusque nostrū discendi, philosophandi; auditas, vt postquā conueniremus, tribus vix horæ minutis, ab arduarum & vtilissimarum rerum indagatione abstinere, An non huius nostræ tam sinceræ amicitiae, & tam suauiter continuatæ philosophandi rationis, gratia, aliquod saltem *ενταρχμο*, vel monumentum, sempiternæ hominum memoriæ commendare debuimus: vt inde

uauissi-

EPISTOLA

suauissimum illud amicitiae vinculum, quo nostri in perpetua copulantur animi, suis quoque necesse disputationibus, postea studiosorum excutitur grās? Et non alter alterius vel cōtemnere studia, vel eruditioni inuidere: capita sed simul conferre, ad veri inquisitionem, & vtilissimas amplificandū disciplinas. Atq; vt hanc potissimum materiam, hoc tempore mihi tractandam, eligerem: penultimæ tuæ ad me literæ, in quibus, de nobili illa, inter nos olim agitata, controuersia, memoriam mihi velle refrire, videbaris, occasionem dedere. Nec in istius enodatione, seu potius demonstratione, longiorem me nunc esse, vel valetudo, quæ iam per integrum annum periculosissimè labefacta fuit (etiam si voluissim maxime) tolerauit: vel ipsa, de Cælestium corporum virtute, Disciplina, desiderare videtur. Ex his enim quæ in medium attulimus, tum ad infinitos particulares, in Arte casus, Apodicticè procedēdi haberi facultas potest: tum ipsa præterea disciplinæ præcipua, in his sunt iacta, confirmataq; fundamenta: vnde de aliis eius Artis quid sit statuēdum præceptis, industrio facile constabit artifice. Non tamen infinitas multorum & *ἀνεπιλογητος* probo nugæ, vel futilia decreta: quæ, nec ipsi talium scriptores, rationum stabilire momentis possint, nec vllus vnquam alius, à Naturæ viribus talia proficisci, obseruando intelligere. Tu ergo qui NATVRÆ obseruantissimus esse Cultor soles: NATVRÆ, in istis Aphorismis, scrutare virtutes veras, virtutes magnas, virtutes paucas vix credibiles Sapientibus, at paucissimis notas. Et ne *τῶν ἀμνηστῶν τις*, suo sibi malo, ea hinc expiscari, elicerēue contendat, quæ illi non sint scripta, tu cum RECEPTERIS, edicas publicè. Atq; hæc hæctenus. Cū autem in literis tuis ad me, fere omnibus, quid ipse præ manibus habeam, à me scire, soles contendere: & in illis certè, quas ante nominaui, penultimis mecum egisti maxime, ut magnum illud opus meum Apodicticum, de Arte noua (vt tu vocas) quàm primum vel in lucem darem, vel eius te vt participem facerem: me Scias, præter periculosissimum, quo toto iam proximè elapso anno laboraui, morbum, alia etiam multa (ab illis, qui, &c.) esse perperis incommoda, quæ mea studia plurimum retardauere: Viresque etiam meas, nondum posse tantū sustinere studiū laborisq; onus, quantum illud, Herculeum penè (vt perficiatur) requireret opus. Vnde si mea

NVNCVPATORIA.

si mea haud queat opera, vel absolui, vel emitti, dum ipse sim superstes: Viri illud Legauit eruditissimo, grauissimòq; qui Artium Mathematicarum vnicum nobis est relictum & decus & Columna: nimirum D. D. Petro Nonio Salaciensi: Illumq; obnixè nuper orauī, vt, si quando posthumum, ad illum deferretur hoc meum opus, benignè humanitèq; sibi adoptet, modisque omnibus, tanquam suo, vtatur: absolueret denique, limare, ac ad publicam Philosophantium vtilitatem perpolire, ita dignetur, ac si suum esset maxime. Et non dubito, quin ipse (si per vitam valetudinēq; illi erit integrum) voti me faciet compotem: cum & me tam amè fideliter: & in artes, Christianæ Reip. summè necessarias, gnauiter incumbere, sit illi à natura insitum: voluntate, industria, vsq; confirmatum. Tuis igitur votis, de laborum meorum euulgandis monumentis, nondum me posse satisfacere, licet iam clarè satis docui. Si tuz tamen petitioni de scriptorum meorum habenda Catalogo, non responderem, meritò me maximæ damnares ingratitudinis: En tibi ergo eorum Titulos, quæ per medias meas, maximasq; difficultates, ita à me mihi cōposita, scriptaq; extant, vt eadem (cum viribus valeam corporis, dulciq; fruar ocio) in publicum producere (non mihi tantum esse cognita,) exoptem maxime.

- 1 *Περὶ Ακρίβειας (αὐτῶς Μελεματικῆς)* opus mathematicè demonstratum. lib. 16.
- 2 De Planetarum, Inerrantium stellarum, Nubiumq; à centro terræ distantis: & stellarum omnium veris inueniendis magnitudinibus. lib. 2. demōst.
- 3 De Speculis comburentibus. lib. 5. demōst.
- 4 De Perspectiua illa quæ peritissimi illustrissimiq; vtuntur pictores. lib. 2. demōst.
- 5 De tertia & præcipua Perspectiue parte, quæ de radiorum fractione tractat. lib. 3. demōst.
- 6 De Cælestis Globi amplissimis cōmoditatibus. lib. 2.
- 7 Speculum vnitatis: siue Apologia pro Fratre Rogerio Bachone Anglo: in qua docetur, nihil illum per Dæmoniorum auxilia fecisse, sed Philosophum fuisse maximum: na-

φ iii.

tura

EPISTOLA NVNCV.

turalitèq; & modis homini Christiano licitis, maximas fecisse res: quas, indoctum solet vulgus in Dæmoniorum referre facinora.

- |    |   |                 |
|----|---|-----------------|
| 8  | De noua Nauigationum ratione.                       | lib. 1.         |
| 9  | De Anuli Astronomici multiplici vsu, capita centum. | lib. 2.         |
| 10 | De Religione Christiana.                            | lib. 1.         |
| 11 | <i>περὶ Ἀναρίστησιν καὶ λογισμῶν</i>                | lib. 6. demōst. |

Aliorum adhuc tacebo nomina: qui tamen ante istorū quosdam (annuente Deo) publica frui luce possint. Hoc autem opusculum, (numero duodecimum) leui munitum armatura, tanquā Exploratore, in varias emitto regiones: vt vera mihi doctorum proborumq; hominum referat iudicia, vorasq; hæc à me tanta tractari, luciq; promitti argumenta. Vt ex istius Exploratoris relatione, mecum & doctis cum amicis, rationem in eam, nū istas meas (qualescūque) copias, in peregrinos adutū producere cāpos, vel domi, adhuc diligentius, in militari educare disciplina, debeam. Iam restat vt te maxime orem, egregia tua Inuenta, tam in excellentissima illa Philosophiæ parte, quæ physicavocatur, quàm in geometricis, & geographicis rebus, publicis (quam primum queas) vt committas hominum studiis: sic enim Rempub. literanā (de qua annos ante multos, multis magnisq; tuis laboribus, es optimè meritis) istis vtilissimis tuis, nouisq; Inuentis, eximie profecto amplificabis. Valeas: Capitisq; tuis pulcherrimis, Deus Opt. Max. exitus largiatur felicissimos. Iterum VALE.

Londini: a nostro nato Redemptore 1558 Iulii. 20.



Typographus Lectori.

*Et habes hic Candide Lector, hanc secundum istorum Aphorismorum additionem, longe emendatissimam, ex ipsius Authoris autographo, accuratissime impressam. Illa enim quae Anno 1558 emissa erat, magna Typographi incuria, permultis claudicabat locis, ueluti tu ipse, ex diligenti nostrorum laborum collatione, facillime iudicare possis. His igitur utaris, fruarisq. Vale.  
Anno à partu Virginico 1567.  
Mense Decembri, Londini.*

EPISTOLA

regrina philosophandi ratio: Nunc proinde ego esse æquum censeo, rationiq. maxime consentaneum, ut iam primò peregrinantes, laborum etiam tu meorum primitiis, iure tibi uendices meritisimo. Et maxime, cum mutuae nostrae amicitiae, familiaritatisq. consuetudo ea erat, toto ut triennio, uix totos tres simul dies, alter alterius lubens careret aspectu: & ea utriusque nostrum discendi, philosophandiq. auiditas, ut postquam conueniremus, tribus uix horae minutis, ab arduarum & utilissimarum rerum indagatione abstinere. An non huius nostrae tam sinceræ amicitiae, & tam suauiter continuatae philosophandi rationis, gratia, aliquid saltem συνταγμα, uel monumentum, sempiternæ hominum memoriae commendare debuimus: ut inde suauissimum illud amicitiae uinculum, quo nostri in perpetuum copulantur animi, suis quoque nequere disputationibus, postera studioforum excitetur atas? Et non alter alterius uel contemnere studia, uel eruditioni inuide: capita sed simul conferre, ad uerit inquisitionem & utilissimas amplificandum disciplinas. Atque ut hanc potissimum materiam, hoc tempore mihi tractandam, eligerem: penultima tuae ad me literæ, in quibus, de nobili illa, inter nos olim agitata, controuersia, memoriam mihi uelle refricare, uidebaris, occasionem dedere. Nec in istius enodatione, seu potius demonstratione, longiorem me nunc esse, uel ualetudo, quæ

Clarissimo viro D. Gerardo

MERCATORI, RVPPELMUNDANO,

Philosopho & Mathematico

illustri, ac amico suo Ioni

gè charissimo,

IOANNES DEE, LONDINENSIS,

S. D. P.



N decimus iam agitur annus (humanissime, doctissimeq. mi Gerarde) ab illo, quo nostris ego relictis Academicis, omnibusq. nostrarum scholarum, in artium septem liberalium dictarum professione, percursis ordinibus: sine subere (ut in proverbio est) nare, & in Regiones transmarinas cœperam peregrinari, ad ipsos inuestigandos fontes, à quibus hac nostra ætate, plurimi ad nos optimarum quarumq. Artium deducebantur canaliculi: & cum illis uitam ducere familiarem, quorum uel leuissimus quisque unius diei in scribendo, labor, nobis antea domi desidentibus, per anni ferè unius spatium, satis (ad intelligendum) faceret negotij. Atque in isto primæ meæ peregrinationis inchoato cursu, quoniam in te, primum omnium, Louanij tum aggentem, incidere, maximo mihi summi Numinis obtigit fauore: & ex tuis mecum disceptationibus, tum primas tum altissimas ut radices ageret tota mea peregrina

A.ij.

regrina

NUNCUPATORIA.

quæ iam per integrum annum periculossimè labefacta fuit (etiam si uoluisssem maxime) tolerauit: uel ipsa, de Cælestium corporum uirtute, Disciplina, desiderare uidetur. Ex his enim quæ in medium attulimus, tum ad infinitos particulares, in Arte casus, Apodicticè procedendi haberi facultas potest: tum ipsa præterea disciplinæ præcipua, in his sunt iacta, confirmataq. fundamenta: unde de alijs eius Artis quid sit statuendum præceptis, industrio facile constabit artificij. Non tamen infinitas multorum & ἀνατολικῶς probo nugæ, uel futilia decreta: quæ nec ipsi talium scriptores, rationum stabilire momenti possint, nec ullus unquam alius, à Naturæ uiribus talia proficisci, obseruando intelligere. Tu ergo qui NATURÆ obseruatissimus esse Cultor soles: NATURÆ, in istis Aphorismis, scrutare uirtutes ueras, uirtutes magnas, uirtutes paucis uix credibiles Sapientibus, at paucissimis notas. Et ne τῶν ἀμνηστῶν, suo sibi maiora, ea hinc expiscari, elicere contendat, quæ illi non sunt scripta, tu cum RECEPERIS, edicas publicè. Atq. hæc hæcenus. Cum autem in literis tuis ad me ferè omnibus, quid ipse præ manibus habeam, à me scire, soles contendere: & in illis certe, quas ante nominauimus, penultimis mecum egisti maxime, ut magnum illud opus meum Apodicticum, de Arte noua (ut tu uocas) quàm primum uel in lucem darem, uel eius te

A.ij.

ut

ut participem facerem: me Scias, præter periculosissimum, quo toto iam proximè elapso anno laboravi, morbum, alia etiam multa (ab illis, qui. &c.) esse perpeſſum incommoda, quæ mea studia plurimum retardauerunt: utresque etiam meas, nondum posse tantum sustinere studij laborisq; onus, quantum illud, Herculeum penè (ut perficiatur) requireret opus. Unde si mea haud quæ, at opera uel absolui, uel emitti, dū ipse sim superstes, Viro illud legavi eruditissimo, grauissimog; qui Aristum Mathematicarum unicum nobis est relictum & decus & columen: nimirum D. D. Petro Nonio Salaciensi: Illūque obtinere nuper orauī, ut, si quando posthumum, ad illum deferetur hoc meum opus, benignè humanitèrque sibi adoptet, modisq; omnibus, tanquam suo, utatur: absoluerit denique, limare, ac ad publicam Philosophantium utilitatem perpolire, ita dignetur, ac si suum esset maxime. Et non dubito, quin ipse (si per uitam ualeitudinemque illi erit integrū) uos ti me faciet compotem: cum & me tam amet fidelitèr, & in artes, Christianæ Reip. summè necessarias, gnauiter incumbere, sū illi à natura instum: uoluntate, industria, usuque confirmatum. Tuis igitur uotis, de laborum meorum euulgandis monumentis, nondum me posse satisfacere, licet iam clare satis docui, Si tuæ tamen petitioni de scriptorum meorum habendo Catalogo, non responderem, meritò me maximè damnas res ingratitudinis. Eū tibi ergo eorum Titulos, quæ

per

per medias meas, maximasque difficultates, ita à me mibi composita, scriptaq; extant, ut eadem (cum uiribus ualeam corporis, dulcique fruar octo) in publicis cum producere (non mihi tantum esse cognita) exoptem maxime.

περί Αριθμολογίας τῆς Μαθηματικῆς, opus mathematicè demonstratum. lib. 16.

1 De Planetarum, Inerrantium stellarum, Nubiumq; à centro terræ distantis: & stellarum omnium ueris inueniendis magnitudinibus. lib. 2. demonstr.

2 De Speculis comburentibus. lib. 5. demonstr.

3 De perspectiua illa qua peritissimi illustrissimiq; uentur pictores. lib. 2. demonstr.

4 De tertia & præcipua Perspectiue parte, quæ de radiorum fractione tractat. lib. 3. demonstr.

5 De Cœlestis Globi amplissimis commoditatibus. lib. 2.

7 Speculum unitatis: siue Apologia pro Fratre Rogerio Bachone Anglo, in qua docetur, nihil illum per Dæmoniorum auxilia fecisse, sed Philosophum fuisse maximum: naturalitèr; & modis homini Christiano licitis, maximas fecisse res: quas, indoctū solet vulgus in Dæmoniorum referre facinora. lib. 1.

8 De noua Nauigationum ratione. lib. 2.

9 De Anuli Astronomici multiplici usu, capita centū. liber vnus.

10 De Itinere subterraneo. liber vnus.

11 De Trigono Circinog; Analogico. lib. 3.

Aliorum adhuc tacebo nomina: qui tamen ante istos rum quosdam (annuente Deo) publica frui luce possint. Hoc autem opusculum, (numero duodecimum) leui munitum armatura, tanquam Explo ratorem, in uarias emitto regiones: ut uera mihi doctorum probos

A. iij.

rum 3

rumq; hominum referat iudicia, uotaq; hæc à me tanta tractari, lucique promitti argumenta. Vt existis Exploratoris relatione, mecum & doctis cum amicis, rationem incam, num istas meas (qualescunque) copias, in peregrinos actū tum producere campos, uel domi, adhuc diligentius, in militari educare disciplina, debeat. Iam restat ut te maxime orem, egregia tua Inuenta, tam in excellentissima illa Philosophiæ parte, quæ Physica uocatur, quàm in geometricis, & geographicis rebus, publicis (quàm primū queas) ut committas hominū studijs: sic enim Rempub. literariam (de qua annos ante multos, multis magnisq; tuis laboribus, es optime meritus) istis utilissimis tuis, nouisque Inuentis, eximie profecto amplificabis. Valeas: Cœptisque tuis pulcherrimis, Deus Opt. Max. exitus largiatur foelicissimos. Iterum Vale.

Londini, anno à nostro nato Redemptore 1558, Iulij. 20.

## Lectori

Philosophiæ sincerioris studioſo,

IOANNES DEE LONDINENSIS  
S. D. P.



APHORISMOS ENTIBI NOSTROS, secunda iam emittimus consultatione: Numero eorum, Ordine, uel Materia, haud mutatis quicquam. Aphorismos, eosdem ego quidem, Proiectis oribus esse scio: At in multarum magnarumq; Scientiarum cognitione non adeo progressis, longiusculos profecto, difficileſq; libros. Ex Communi, tritaue philosophandi uia, qui huc (Miser) diuerterit, Labyrinthum esse diuersorium, actū tum exclamabit. Quodcumq; enim egregium, in Antiquorum uel Verorum quorumcumq; philosophorum experientia Theoriæ fuisse aliquando positum, uel legendo, uel meditando, uel periclitando, uel peregrinando, ipsemet intelligere, excogitare, inuenire, audire, uidereq; olim potui, id omne, uel SELECTISSIMA QUAEQUE potius, IN CORPVS VNVM SOLIDVM & QUONIAM CONGLOBATA, tuis hic commisi studijs. Et præter omnium Maiorum nostrorum Inuenta præclarissima, quàm Mirificis, Honorificisq; ornamentis hoc sit confertum Συναγυα, frequenti si tu perquiras lectione (accuratius quæq; pensitando) certissimè conspicies. Sed tamen quæ ego ueritatis illustrande, amplificandeq; stimulatus desiderio (quò soli tibi essent plenissimè perspetas) a neruos mei contenderim ingenio, tu noli indignis profanisq; manifesta reddere: ne & tibi & mihi tum dedecori, tum damno uertatur maximo. Vale amice: Manibusq; bene precator meis.

Ex Museo nostro Mortlacensi,  
Anno 1567. Decemb. 24.

A. i.



# Ioannis Dee Londinensis, de

præstantioribus quibusdam NATVRÆ

*Virtutibus προαεινματα ἀφοριστικά.*

## Aphorismus 1.



**V**T DEVS, EX NIHILO, CONTRA rationis & naturæ leges, cuncta creauit: ita in Nihilum abire, rerum creaturarum aliqua nunquam potest, nisi contra rationis Naturæq; leges, per Supranaturalem Dei potentiam fiat.

2.

**M**irabiles ergo rerum naturalium Metamorphoses fieri à nobis, in rei veritate possent, si artificiosè Naturam ex pyronomiæ Institutis vrgeremus. Naturam autem ego dico, Rem Creatam quamcunq;.

3.

**N**on solum ea Esse asserendum est, quæ Actu in rerum natura sunt conspicua, notiq; Sed & illa quoq; quæ quasi Seminaliter, in naturæ latebris Extare Sapientes docere possunt.

4.

**Q**uicquid Actu existit, Radios orbiculariter eiacular in singulas mûdi partes, qui vniuersum mundum suo modo replent. Vnde omnis locus mundi radios continet omnium rerum

## PROPÆDEVMATA

X.

**Q**uæcunq; res sunt sibi mutuo coordinate, cõueniētes, vel conformatae, vna aliam tũ sponse imitatur sua, tum etiam aliquãdo vna ad aliam localiter accurrit: vnaq; aliam (quantum potest) tuetur & munit, etiam si interea vis sibi inferri videretur. Per harum ergo rerum naturalium (modis varijs) in mundo Separatim existentium, Vnionem: & aliarum Seminaliter tãtum prius in Natura positarum, Actuationem, mirandamagis, verè, naturaliterq; (nec violata in Deum fide, neq; Christiana læsa religione) præstari possunt, quàm quis mortalis, credere queat.

XI.

**M**undus iste totus est quasi lyra, ab excellentissimo quodam artifice concinnata: cuius chordæ, sunt huius vniuersitatis Species singulae, quas qui dextrè tangere pulsareq; nouerit, mirabiles ille eliciet harmonias. Homo autem, per se, Mundanae isti Lyrae, omnino est Analogus.

XII.

**S**icut lyra, constitutio quædam est tonorum consonantium atq; dissonantium, aptissimam ad suauissimam & infinita varietate mirabilem exprimendam harmoniam: Sic Mundus iste partes intra se complectitur, inter quas arctissima conspiciatur Sympathia: alias autem inter quas dissidium acre, atq; Antipathia notabilis: ita tamen, vt tum illarum conspiratio mutua,

tum

## APHORISTICA.

rerum in eo Actu existentium.

5.

**T**Am Substantia quàm Accidens, suam à se Speciem exerunt: Sed Substantia omnis, excellentius multò quàm accidens. Et Substantiarum quidem, illa quæ incorporea & spiritalis est, (vel quæ Spiritalis facta est) in hoc munere longè superat illam quæ est corporea, ac ex fluxis coagmentata elemētis. Licet quantò res sunt nobiliores, tantò incompletiorem suam Speciem faciant: Species enim completa, idem obtinebit nomen cum principali agente.

VI.

**S**icut vna res differt ab alia, ita & earundem radij differunt in efficiendi virtute, & effectus conditione, dum circa eandem omnino rem operantur.

VII.

**R**adiorum quorumcunq; ab vna re in diuersas emanantium, diuersi sunt effectus.

8.

**Q**uicquid in aliud agit, simile quodam modo est, at alio quidem modo dissimile prorsus illi est in quod agit, aut nulla est actio.

9.

**Q**uicquid in mundo est, ad aliud quid ordinem, conuenientiam, & conformitatem

## APHORISTICA.

tum istarum lis atq; dissensio, ad Totius consensionem atq; Vnionem admirandam egregiè faciat.

XIII.

**S**ensus nostri, non sunt sensibilibus radiorum à rebus effluentium causæ, sed testes.

XIII.

**S**pecies non solum spirituales, sed etiam aliæ naturales à rebus effluunt, tum per Lumen, tum sine lumine: non ad visum solū, sed ad alios interdum sensus, & præcipuè in Spiritu nostro imaginali, tanquam Speculo quodam coalescunt, seque nobis ostendunt, & in nobis mirabilia agunt.

15.

**N**illus Motus perfectior orbiculari, Nec vlla forma humanis exposita sensibus, LVCE est vel prior vel præstantior. Corporum igitur præstantissimorum & perfectissimorum, hæc duo maximè propria erunt.

16.

**Q**uicquid in mundo est, continuè mouetur aliqua motus Specie.

17.

**P**ro ratione motui primorum, qui sunt celestium corporum maximè proprii, cæteri inferiorum motus omnes naturales & excitantur & ordinantur. Mouentur autem ipsa Cœlestia aliquando sursum, aliquando deorsum: in anteriorem aliquando partem, aliquando in posteriorem

B.ij. riorum

riorem, aliquando versus vnum Mundi, vel E.  
clipticæ polum, aliquando versus alterum.

18.

**I**N singulis quatuor, Maioris Mundi magnis  
Matricibus, sunt tres diuersæ partes: simul tamē  
concrete, conformataq; & iustis suis contempe-  
rata ponderibus: quas iam Notariacè  $\dot{A} \dot{O} \dot{S}$ , siue  
 $\dot{O} \dot{S} \dot{A}$ , siue  $\dot{S} \dot{O} \dot{A}$  appellare libet (Sic me enim  
Pyrologi intelligunt) Harum Trium proprie-  
tates effectusq; naturales tum principales tum se-  
cundarios tum etiā tertios, quā potes exactis-  
simè discas: Modumq; reducendi tertios ad se-  
cundos, & secundos ad primos: Itidem tibi est  
summopere examinandum, quibus casibus, ea-  
dem pars, diuersorum, immo contrariorum nō  
nunquam effectuum esse causa possit.

19.

**S**I duo, tria, vel quatuor Elemēta, & in quacū-  
q; quantitate commisceantur, vt de compo-  
ti illius vera natura, Complexione siue Tempe-  
ramento fias certior, per artem quandam, Gra-  
duationum dictam, tibi est elaborandum.

20.

**E**X qua elementorum proportionē, singula  
humani Corporis partes, humores, & spi-  
ritus constent (quā propē fieri potest) Astro-  
logo est peruidendum. In alijs etiā rebus natu-  
ralibus idem experiri, atq; intelligere est summè  
necessarium

XXIII.

**I**lla Deus in Magnete proposuit oculis morta-  
lium spectanda, qualia alijs in rebus subtiliori  
mētis indagini, & sedulitati experiendi maiori,  
inuenienda reliquit. Ego tibi vim eius attractiui  
primò, deinde expulsiui, repulsiui, siue aba-  
ctiui, tertio celestis certiq; cuiusdam situs ap-  
petitionem, Et quartò per solida corpora radios  
suos essentielles traijciendi potentiam, nūc solum  
in mentem redigo: aliās alia eiusdem Philoso-  
phici lapidis, quā miracula (diuino fauente Nu-  
mine) explicaturus.

XXV.

**D**Vplices sunt stellarum omnium radij: alijs  
sensibiles siue luminosi, alijs, Secretiores sunt  
Influentiæ. Hi omnia quæ in hoc mundo conti-  
nētur, puncto quasi temporis penetrant: illi ne a-  
deò penetrēt, quodam modo impediri possunt.

XXVI.

**S**Tellæ & vires coelestes, sunt instar Sigillorum,  
quorum characteres pro varietate materiæ e-  
lementaris, variè imprimuntur. Quemadmodū  
& nostrorum sigillorum in sculptæ formæ, facili-  
us in vnam materiam quā in aliam imprimun-  
tur: elegantius in vna, quā in alia: & tenacius  
in vna quā in alia hærent: & in quibusdam ad  
quandam quasi perpetuitatem. Hinc Gamæas  
considerabis attentius, aliaq; maiora.

XXVII.

necessarium, & valde iucundum.

21.

**S**Emen quodq; in se potentia habet generatio-  
nis cuiusq; integrum & constātem ordinem:  
eo quidem modo explicandum, quo & concipi-  
entis loci natura, & Circumfusi cœli superueni-  
entes vires, cooperando conspirant.

22.

**S**icut primi motus privilegiū est, vt sine eo tor-  
peant omnes reliqui, sic primæ & præcipuæ  
Formæ sensibilis, (nimirum  $LVCIS$ ) ea est fa-  
cultas, vt sine ea cæteræ formæ omnes agere ni-  
hil possint.

XXIII.

**O**ΤΙ ΑΙ ΔΙΑΝΟΙΑΙ ΠΟΝΤΑΙ ΤΩΣ ΣΩΜΑΤΙ ΚΑΙ ΔΥΝΕΙΣΙΝ ΑΥΤΑΙ  
ΜΕΤ' ΑΥΤΑΣ ΑΠΑΘΗΣ ΟΥΣΑΙ ΤΩ ΤΩ ΣΩΜΑΤΟΣ ΚΙΝΗΣΩΝ,  
quis philosophorum non decantat? quis morta-  
lium nō in seipso id ferè quotidie experitur? Vt  
etiā & τῶσ τῆσ ψυχῆσ παθήμασι τὸ σῶμα σύμπαρον  
γίνεσθαι. Vnde Medicus per corpus sanat animam  
atq; temperat. Musicus autem per animam, cor-  
pori medetur & imperat. Qui ergo quā pluri-  
mis modis tū medici tū musici poterit supplere  
munus, is hominum & corpora & animos pro  
sua ferè gubernaret voluntate. Verum hoc est à  
modestius philosophantibus, mysterij cuiusdam  
instar tractandum.

B. iij.

XXIII.

XXVII.

**T**Am solida quā diaphana cuncta, quæ intra  
mundi ambitum existunt, penetrandi vis,  
coelestium radiorum maximè propria, magnam  
illis influendi, siue suas imprimendi vires facili-  
tatem inesse demonstrat. Vt autem cum elegan-  
tia quadam, deinde cum tenacitate, vel ad infinitum  
fere tempus retineatur immissa virtus, id ex  
materiæ in quam influitur dispositione naturali  
vel præparatione artificiosa, tam in visibili forma  
quā in elementaribus qualitibus & alijs, pro-  
uenire debet.

28.

**P**Rimū mobile est instar speculi sphaerici cō-  
caui, cuius qualem cūq; soliditatem nullus stel-  
larū radius sensibilis penetrare potest: cū et-  
iam nullus esset talis penetrationis vsus apud supe-  
ros: sunt & alia per plures demonstrationes.

XXIX.

**Q**Vascunq; vires per sensibiles radios, stellæ ef-  
ficiendo exercent, non solum directis,  
sed etiā fractis & reflexis illis radijs, tales suas  
vires ad effectus oportunos promouere possunt.

XXX.

**M**agnitudines verè non solum terrestris glo-  
bi, sed & planetarum fixarumq; omnium  
stellarum, astrologo debent esse notæ.

C. i.

XXXI.



**D**istantiæ veræ tam fixarum, quàm singulorū planetarum à centro terræ, quocunq; proposito tempore, astrologo constare debent: sicut & nubium, siue crassioris aëris, variae à terra altitudines.

**Q**uibus terræ locis, quæcunq; stella siue fixa siue erratica quocunq; dato tempore perpendiculariter immineat: & quantum incidentiæ directæ angulum, cum omnibus alijs locis, supra quorum horizontes, eadem stella, eodem temporis momento eleuatur, efficiat, cum primis est cognitu necessarium.

**S**ensibilem omnem radium, à stellæ alicuius corpore ad punctum aliud quodcunq; externum emanantem, ac cum eiusdem stellæ conuexæ superficiei æquales vndiq; efficientem angulos, circumstat conus rectus, radiosus, sensibilisq; cuius Axis, ipse dictus radius erit: Vertex verò, punctum illud externum: Basis denique, conuexæ superficiei ipsius stellæ ea portio luminosa quæ dicto vertici est proxima, terminaturq; per circuli circumferentiam, ab illo termino lineæ rectæ (à dicto vertice ad stellam ductæ) qui ipsam stellam contingit tantum, descriptam.

portione radios illos directos ad terrā demittūt.

**O**mnes stellæ terra minores, quanto terræ propinquiores fuerint, tātō fortiores, eidem sui Luminis radios infundunt: licet minorem eiusdem portione sensibilibus illis suis directisque radijs afficiant, quàm quādo sunt remotæ magis.

**O**mnes stellæ terra maiores, quāto terræ viciniore fuerint, tanto fortiores illi suos imprimunt radios: & terræ etiam maiorem portionem sensibilibus istis suis, directisque radijs illumināt, quàm quando longiori sunt remotæ intervallo.

**P**erpendendæ tibi sunt cum summa diligentia Terræ & stellarum quarumcunq; tum terra maiorum, tum terra minorum, portiones illæ Superficiales, Sphæricæ conuexitatis, in stellis quidem luminosæ, at in terra ab ipsis luminosis illuminatæ, quæ pro varijs stellarum à terra intervallis, diuersarum sunt quantitatū. Et tam in terra quàm in stellis terminantur per terminos superficiei conicæ curvæ, à lineæ rectæ, tum ipsam terram, tum ipsarum stellarum corpora contingente, descriptæ. Atq; de his portionibus egimus propositionibus. 35. 36. 37. & 38.

**R**adiorum à basi luminosa alicuius stellæ, ad aliquod externum punctum effluentium, Axis est fortissimus: & reliquorum, quò ipsi axi fuerint propinquiores, eò erunt remotioribus, fortiores, respectu dicti puncti. De radijs ex profunditate stellarum corporum egredientibus, alius nobis erit dicendi locus.

**A**stellæ terra minoribus, sensibiles cuncti qui exeunt radij directi ad terræ conuexitatis, quantam maximam possunt portionem, ab ipsarum conuexarum superficierum (quæ tales stellas ambiunt) portionibus veniunt, quæ sunt dimidijs maiores. Et quò terræ propiores fuerint, eò à maioribus illis portionibus, radios suos directos terræ communicant: Nunquam tamen terræ conuexitatis dimidium suis illis sensibilibus radijs attingere queunt, sed portionem, eiusdem dimidio minorem.

**O**mnes stellæ terra maiores, plus quàm dimidium terræ conuexitatis, omni tempore suis sensibilibus & directis radijs illustant: Semper etiam à suæ conuexæ superficiei portione dimidio minore, illos terræ impertiunt radios. Et quò terræ propinquiores fuerint, eò à minore tali

**A**d quodcunq; punctum totius mundi venit alicuius stellæ conus rectus, radiosus, sensibilisq; eiusdem coni basis, minor quidem semper erit, quàm dimidium conuexæ superficiei ipsius stellæ, cuius ille fuerit conus. Videant ergo astronomi, quā ratione stellarū metiantur diametros.

**Q**uanto eadem stella ab aliquo puncto totius mundi remotior fuerit, tanto sui radiosius coni recti sensibilisq; basis, maior euadit, & quāto Propinquior, tanto minor.

**E**xamināda tibi erit quātitas huius basis conicæ, in omni posito cuiusq; stellæ, respectu vnus alicuius puncti, vbicunq; illud punctū statuatur.

**E**iisdem stellæ Coni recti luminosi longiores, sunt ipsis breuioribus, quibusdam de causis fortiores: at alias ob causas, longè debiliores: fortiores quidem eò videri possunt, tum quod eorū bases luminosæ, maiores sunt, tum quia anguli ad verticem, minores fiant. Ex his duabus causis simul iunctis, hæc nascitur ratio: Quòd in longioribus conis, copiosiores radij, non incidentes solum sed etiam reflexi, magis vniuntur: vnde ma-

ior vis circa talem verticem exercetur. Sed naturaliter & simpliciter, propinquitās agentis ad id in quod agit, breuius conos, fortiores efficit.

XLIII.

**Q**uantitatem illius conuexae superficiei Lunaris, quae quocumque dato tempore, nobis illuminata conuertitur, accuratè elicias.

XLV.

**H**orizontem nostrum verum, illum appellamus circulum, qui circumductu eius lineae describitur, cuius quiescens terminus in Mundi centro fuerit, alter verò in summo statuatur coelo: ita ut à nostro vertice in huius circuli centrū demissa recta linea, eidem circulo perpendicularis existat. At Sensibilem nostrum Horizontem, alibi demonstrauimus esse illam terrestris sphaerae conuexam portionem, quae (omnibus super terrae vniformem conuexitatem, remotis impedimentis) nobis est conspicua tota: terminaturque per circuli circumferentiam, ab illo termino lineae rectae (ab oculo nostro ad terrae contactum ductae) qui ipsam terram contingit, descriptam. Hancque portionem aliquādo maiorem, aliquando minorem à nobis posse conspici, pro varia nostrae altitudinis ratione supra vniformem terreni globi conuexitatem, ibidem docuimus. Ex hac quidem consideratione plurima pendet, quae tū in Optica, tum in Astrologia, tum in Magia,

magnitudinem: quae etiam mutabilis est.

XLVIII.

**S**olem infra nostrum verum horizontem existentem, accidentarij sui luminis radios ad nos ab aëre procurare, Crepusculinæ eius Lucēs demonstrat: Tres igitur Superiores & fixarum plurimae, cum magis sub horizonte latent, quam ipse Sol, in Crepusculi matutini principio, vel vespertini fine, nobis, sui accidentarij Luminis virtutem, (licet per se non tam sensibilem quam Solis) communicabunt, instar quorundam suorum crepusculorum. Planetas etiam Sole inferiores hoc modò considerandos moneo. Fitque hoc (ut dixi) non per principalem aliquem radium, scilicet vel directum fractum vel reflexum) sed per Speciei Speciem, ut *ὑπερκοίτης* & *κατοπτικοί* periti vulgariter loquuntur philosophi. Qua ratione Solaria Crepuscula inaequalia fiant, vide: & de aliorum planetarum Crepusculis (vri nos nunc illa appellamus) simili perquiras methodo.

XLIX.

**Q**ua ratione stellae fixae & singuli planetae, tam infra horizontem, quam alibi constituti, ad nos vel alia terrae loca, radios sui luminis, non ab ipso coelo solum, sed aëre, nubibus, aqua, montibus, & similibus corporibus reflectant, perscrutare: radiorumque coelestium fractiones multipli-

ces

gia, magni esse momenti, experientes percipient.

*ὑπερκοίτης*

Quaecumque igitur duo coeli puncta ex diametro sunt opposita, vnoquoque temporis momento in infinitis extant veris Horizontibus: Sed quaecumque duo coeli puncta, minus Semicirculo distiterint, in vnico tantum haberi possunt Horizonte vero, eodem temporis articulo.

XLVI.

**O**mnes stellae maiores terra, ab aliqua sui portione radios sensibiles directos, ad nos mittere possunt, antequam earundem centra ad nostrum verum horizontem oriendo perueniant: Atque ratione eadem, in occasu, sub ipso vero horizonte depressis earundem centris, nos tamen illuminare suis directis radijs possunt.

XLVII.

**O**mnes stellae, cum in horizonte vero alicuius loci terrestris fuerint, plus in recta linea, ab illo loco distant, quam cum supra illius loci horizontem sunt eleuatae: siue vno eodemque die, siue quibuscumque diuersis: modò eiusdem stellae, in illis varijs temporibus, aequalis fuerit distantia à centro terrae. Alioqui enim Sol in Capricorni principio oriens, longè nobis propinquior est, quam quorum imminet capitibus, in Cancro versans: & hoc propter suae eccentricitatis

*C. iij.*

magnitudinem

ces attende in aëre, nubibus, & aquis: Et infinitam Dei bonitatem Sapientiamque admirari & laudare cogis.

L.

**V**T Stella quaelibet proprium habet nomen ex ipsius Dei impositione, Sic & naturam in se habet virtutemque propriam, qualis in nulla alia, eadem omnino inueniri potest.

LI.

**A**d quodlibet totius mundi punctum, & quolibet temporis momento, ab omnibus stellis fixis & planetis fit talis radiorum cōcurfus, qualis, ex omni parte similis, ad nullū aliud punctum, nec villo alio tempore, naturaliter cōstitui potest.

LII.

**K**ατοπτικοί si fueris peritus, cuiuscumque Stellae radios in quamcumque propositam materiam fortius tu multo per artem imprimere potes, quam ipsa per se Natura facit. Haec quidem Antiquorum Sapientum multo maxima naturalis Magiae pars erat: Et est Arcanum hoc, non minoris multo dignitatis, quam ipsa augustissima philosophorum ASTRONOMIA, INFESTIOR nuncupata: cuius Insignia, in quadam inclusa MONADE, ac ex nostris Theorijs desumpta, tibi vnā cum isto libello mittimus.

Di.

*ὑπερκοίτης*

*Haec insignia  
fuisse bea  
bet explicata  
in notis  
et enclitica  
bellis, cui est  
Titulus MOA  
N. A. S. Hic  
typographia.*



**H**inc obscuræ, debiles, & quasi Latentes rerum Virtutes, arte Catoptrica multiplicatæ, sensibus fieri nostris manifestissimæ. Vnde non in stellarum solum, sed aliarum quoque rerum propriæ examinandis viribus, quas per Sensibiles exercent radios, diligens Arcanorum Inuestigator, maximum sibi oblatum auxilium habet.

LIII.

**S**iquid vel Solis lumen per Lunam efficiat, vel quid ipsa ex se sola, nullis imbuta SOLIS radijs sensibilibus præstare possit, cognoscere quis cupiat: ex plenilunio, & Lunæ eclipsi totali cum mora, artificio catoptrico, elicere potest. Ut alia autem, eundem traducat experiendi modum, non opus est ut moneam.

LIIII.

**Q**uò magis ad perpendicularitatem super aliquam elementarem superficiem accedit axis radiosus alicuius stellæ, eò fortius circa talem suæ incidentiæ locum, suas vires illa stella imprimeret: directo quidem modo, propter maiorem agētis vicinitatem: reflexo autem, quia reflexi tales radij, ad incidentes, vicinius conduplicantur. Eccentricitatis ratio, in diuersis zodiaci locis, planetas propiores nobis exhibere potest, cum acutissimus prorsus erit incidentiæ angulus cum nostro

ti quatuor æqualium horarum spatium, æquatoris conficit periphæria: atque hunc Diurnum Totius motum vulgariter vocant.

LIX.

**Q**uò æquatori sunt propiores paralleli circumferentiæ, æquatoris sequuntur motum.

LX.

**Q**uam inter se rationem habuerint, circulorum duorum quorumcunque æquatori parallelorum, circumferentiæ, eandem rationem habebunt, & earundem velocitates, in diurno Totius motu: Hoc tu ad planetas & stellas fixas trāsfer, diurnorum arcuum respectu, &c. Circumferentiæ autem eam inter se habent rationem, quam ipsorum Diametri Circulorum.

LXI.

**P**eriodos quasque videmus NATVRÆ præpotentis inuiolabili lege, à cælestibus ipsi absolui corporibus, maxima cum diligentia, à nobis animaduertendas asserimus: PERIODVM hoc loco vocamus, planetæ, stellæ fixæ, vel alicuius cælestis puncti, ad priorem locum vel priori valde similem, per circula rem motum, completam restitutionem. Tempusque quod interea fluit, huiusmodi Conuersionis, Periodum nominamus.

LXII.

stro vero horizonte, vel alia superficie. At nos, & supra de hac re diximus: & nunc significamus, in æqualibus à centro terræ distantijs, generalem hunc nos enuntiare aphorismum: esse tamen tum utilissimum, tum iucundissimum considerare exceptionis huius rationem, in varijs eccentricorum circulorum locis.

LV.

**Q**uò stellæ eiusdem Mora, supra horizontem maior fuerit, eò ad suæ virtutis fortiorem faciendam impressionem, per directos suos radios, est accommodatior.

LVI.

**E**x horum tantum trium diuersa contemperatione, scilicet Vicinitatis, Anguli incidentiæ, & Moræ, o quam multiplex consurgit ratio pro viribus eiusdem stellæ exercendis, supra alicuius loci horizontem.

LVII.

**M**omentaneus quilibet cœli status, tum effectus suos meritis infinitos, tum in aliorum euentuum Semina (cōgruis maturanda constellationibus) vires intendit ac imprimit efficaces.

LVIII.

**O**mnium cœlestium motuum, ille velocissimus est, quem, versus occasum, semper, viginti

D.ij.

ti

LXII.

**A** Natura omnes hos illustriores recipimus circulos: Horizontem, Meridianum, Æquatorem, & illi parallelos omnes: Eclipticam: Eccentricos planetarum: Epicyclos, & alios, quos ex Theoricis planetarum, Astronomicisque Canonibus, accuratè discendos, monemus.

LXIII.

**C**irculi omnes, Positionum (vulgariter sic dicti) sunt circuli naturaliter definiti: Cū omnes illi quorundam aliorum locorum sint horizontes veri: etiamsi infiniti tales, inter horizontem tuum & meridianum statuerentur. At quò propius versus mundi polos accedis, Naturam vides quasi pedetentim istos reculare: duasque tantum ex tribus illis generalissimis, Cœlestia Themata describendi vijs, sibi sub polis assumere: ut & sub æquatore duas præcipue admittit: in locis autem intermedijs, tres: per meridianos scilicet: circulos, eclipticæ longitudinem ad rectos secantes angulos: & per istos horizontales: licet infinitis alijs modis, Natura, suarum distinguat virium proprietates.

LXIII.

**P**eriodus æquatoris, est alicuius in æquatore, vel alterius puncti cælestis, ad eundem meridianum, restitutio: viginti quatuor æqualium horarum spatium, per motum Totius diurnum,

D.ij.

absoluta.

PROPAEDEVATA

absoluta. Haec autem omnium coelestium periodorum, est simplicissima, sibiq; semper aequalis,

LXV.

**D**ies naturalis, siue periodus Solis diurna, est tempus quod fluit, dum per Totius motum diurnum, Solis centrum ad eundem reducitur meridianum: Ista quidem periodus, valde inaequalis existit longitudinis.

LXVI.

**A**nus tropicus solaris, est tempus periodicum, quo Sol, per proprium suum motum, ad eundem eclipticę summę locum restituitur. Huius magnitudo hac nostra ætate, obseruata est, dierum esse 365, horarum 5, & scrupulorum primorum 55, secundorum autem, ferè 20. Multabilem etiam huius esse longitudinem, obseruationes excellentium Mathematicorum exactissimæ, demonstrant.

LXVII.

**A**nus Solaris siderius, est tēpus periodicum quod labitur interea dum Sol per propriū motum suum, ad eandem stellam fixam redit: vel ad æqualem prorsus distantiam (secundū eclipticę longitudinem) ab eadem stella fixa. Cuius magnitudinem, Thebites, Choræ filius, inuenit dierum naturalium 365, horarum 6, scrupulorum

PROPAEDEVATA

perpendendas commendamus, tam in eccentricis, quam in epicyclis suis, per proprios suos motus. Simples quidem per se (quantum potes) ut distinguas, cōpositas item scorsim, monentes,

LXXI.

**V**T Lunę periodicas cum sole cōtiones obseruamus, ita & cuiusq; planetę reditū ad alium tardiori affectum motu (vero quidem & proprio) quam is est, cuius restitutionem periodicā consideramus, maxima diligentia notandum significamus.

LXXII.

**V**T motus ille, qui est æquatoris proprius, omnium coelestium motuum est velocissimus, ita planetarum omnium periodi diurnæ, sunt omnium quas verè conficiunt, breuissimo transactæ tempore.

LXXIII.

**E**x coelestium corporum Imitatione, quæ in inferioribus regulari aliqua & ordinata fieri ratione cernitur, sinceræ veritatis amantes, studioseq; experientes, clarissimè elicere possent, quæ res, vel tota, vel in sui aliqua parte, cui planetæ, fixæ, vel plurium stellarū colligationi subiiciatur maximè: ita ut ille planeta, stella fixa vel plurium stellarum colligatio, huius rei vel effectus, præcipuus & quasi proprius Significator (astrologorum

APHORISTICA.

rum primorum 9, secundorum autem 20. Copernicus autem aliquanto maiorem, hoc nostro seculo esse, demonstrauit: per 20 circiter secula, scilicet.

LXVIII.

**L**Vnare periodos veras, tū ad eandem eclipticę longitudinem, tum ad Solis coniunctionem, exacta ratione per numeros examinatas, pro quocunq; dato tempore, habeas. Sunt enim inæquales valdè.

LXIX.

**P**eriodus Lunę diurna, siue dies Lunar, est per motum Totius diurnum, lunaris centri ad eundem meridianum restitutio perfecta: singulis penè diebus, hæc, suam mutat quantitatem. Similes etiam reliquorum planetarum restitutiones ad eundem meridianum, considerantes, eadē appellabimus eorundem Dies: videlicet vel Saturni, vel Iouis, vel Martis, vel Veneris, vel Mercurij. Fixarum stellarum tardissimus motus, diei vnus spatium, parum exhibebit discriminis inter suam & Æquatoris diurnam periodum.

LXX.

**V**T Luminariū secundū eclipticam, ita reliquorū quinq; planetarū omnes, quas verè & naturaliter cōficiunt periodos, tibi omni tēpore D. iij. perpendendas.

APHORISTICA.

astrologorum ut utamur phrasi) possit censeri. Ista autem Imitationē varijs posse modis fieri, cuius constare credo philosophanti. Non me ergo est vel in Motu solo, Forma vel Figura, sed in alijs etiam proprietatibus & qualitatibus, hæc obseruari velle putandum.

Confectarium. 1.

**M**agus proinde industrius, Microcosmi Analogis stellaturis, ita Signata, applicando, Harmoniam experiretur maximam. Quæ enim Vni Tertio cōueniunt, & inter se convenientiam habere necesse est.

Confectarium. 2.

**H**orum ergo Trium, duobus quibuscūq; notis, quale quærendum est Tertium, constare potest. Horumq; Trium Anatomix, singulorum propriæ, sunt in reliquis duobus: Sed modo quidem diuerso, scilicet Cœlesti, Terrestri, vel Microcosmico. Exempli gratia, Solem, Aurum, & Cor hominis, tibi proponimus ex Anatomix Magicæ consideranda Legibus.

LXXIII.

**I**n qua significatione aliquis planeta, stella fixa, plurium stellarum commixtio, vel cœli locus, præcipuè excellit, ad illum Significatorem, omnes reliqui tum planetarum fixæ, in illa quidem significatione comparari debent: ut quid vel au-

E. i.

xlij,



xlij, vel impedimēti ab illis recipiat in sui muneris administratione, artificiosa eliciatur indagine.

LXXV.

- 1 Quid Fixarū mutua interualla, ex omni temporis aeternitate nunquam sunt mutata, huius elementaris mundi illis rebus, quæ & sui etiam status constantem valde retinent conditionem, istas maximè præesse demonstrat. Cum tamen, & istæ, Motu quodam (scilicet tardissimo) secundum Eclipticæ longitudinem versus orientem, tam ferantur vniformiter, ac si omnes vno eodemq; agerentur spiritu, hoc quidem & maximarum nostrarum rerum, seu illarum quas iam, è nostris, maximè constantes, suisq; similes maximè, iudicamus, mutationes, vicissitudinesq; fieri significat. 2 Istarum deniq; per Diurnum Totius motum, Circductio: ad totam illam cœlestem constantemq; Harmoniam, ex omnibus stellis fixis resulatē, qua sibi mutuò sunt colligatæ (quæ etiam rerū omnium quasi Forma Prima existit) toti elementari regno, & totam cuiuslibet eiusdem particulæ, per principales partim suos radios, partim per accidetarios, abundāissimo quidem modo impertiendam, (ita ordinante Totius beneficentissimo & Sapientissimo Opifice) est instituta. Et hoc ni esset, Nullum, ne vno quidē die (naturaliter) præferuaretur Indiuiduum.

LXXVI.

nobis maximè distent) terra plus octodecim vicibus maiores existant: tum etiam, vel quòd materiam, in quam agunt, aptissimam inueniunt dispositionem: vel quòd ab aliquo planeta, earundem corroborati radij, viuaciores quasi, firmioresq; in terram torquentur: vel ab accommodatissimo aliquo τὸν πρῶτον ad stellarum exprimendas vires loco, adiutæ, tam exiguo temporis interuallo, suarum repetant virium effectiones. Quid de illis ergò fixis cogitare debemus, quarū aliæ totum terrestrem globum sua mole trigelies, aliæ quinquagesies quater, aliæ septuagesies, aliæ octuagesies excedunt? Sed illarum (te quæso) quæ terræ soliditatem, centies septiesq; sua complectuntur magnitudine, quantam credere debemus esse efficientiā? Ab omnibus ergò omnium ordinum fixis, diuinissima per cœlum distributis harmonia, quantam quasi diuinitatem simul interras deriuari censendum?

LXXIX.

Si ex Diei naturalis tempore, deducatur vna æquatoris periodus, residuumq; tempus in æquatoris partes resoluatur, clarissimè apparebit quanta æquatoris portio, versus occasum, verè naturaliterq; (præter suā integram periodum) intra vnus diei naturalis spacium, per ascensiones (Rectas, nominatas) promoueat. Atq; hæc est vera & propria demonstratio, illius vtilissi-

mæ

LXXVI.

VT Motus Fixarū proprius, generaliter nobis demonstrat, easdem talium effectuum esse causas, qui longo temporis cursu incrementa atq; alterationes suscipiant suas: Sic pro naturæ proprietate, quæ duabus quibuscūq; vel pluribus fixis (tam ex sensibili earum radio, quàm ex virtute specifica) inest, ipsius naturam euentus, qui à duabus, vel pluribus stellis fixis efficitur, significatur: propriè, diuersam esse, est necesse.

77.

AGens debile, vt actionis fortioris specimen edat, quàm Agens simpliciter æstimatū fortius, sepè vsuuenit: & hoc, aliquādo propter diuersitatem Subiectorum, (in quæ agunt) in dispositione sua natiua, siue artificiosa: aliquādo autem, propter alias causas. Hoc maximè norūt, qui Artis Sanctæ Limina Salutant. Quod ritè enim Septies est Separatū, Præparatū est, vt Septies quoq; Coniungatur: ad celeberrimam illam philosophorum Gamearum conficiendam. Hoc (Dei Nutu) דאידעם דאידעם Dauidicū, esse, asserere audeo: quod ita nobis Dualiter expressū est.

LXXVIII.

Non est ergò mirum, fixarum Stellarū, quasdam, quæ inter illas minimæ iudicantur, annis singulis certas atq; sensibiles in aëre & alijs rebus, effectus producere: Tum quòd illæ (licet à E.ij. nobis

mæ ac admirabilis Astrologicæ Praxeos, quæ cōmuniter DIRECTIO appellatur DIVINA.

LXXX.

QVando illum Æquatoris progressum Directorium, quolibet die naturali, secundum ascensiones Solaris loci rectas, examinaueris, tunc vnà etiam totius cœlestis Machine, alium quemcūq; libet, contuere locum: cuius quanta sit facta promotio Directoria, super vel meridianū circulum, vel horizontalem, tali loco accommodatum, interea temporis, dum illam principalem, in Solis loco metimur, diligenter annotabis. Directorij autem motus quantitatem, nunc per ascensiones vel rectas vel obliquas, definimus.

LXXXI.

EX Die Lunari, subtrahas Æquatoris periodū, & quātum, illo modo, in die vna Lunari, cuncta cœlestia loca, pro ratione suarum vel rectarū vel obliquarum ascensionum, Directoriæ (vt ita dicam) protrudantur, clarum euadet.

LXXXII.

PERiodus Horizontalis Diurna, planetæ, stellæ fixæ, est tēpus quod fluit, dum illorum centra per motū Totius Diurnum, ad eundem restituuntur horizontalem circulum.

LXXXIII.

EX Horizontali Solis vel Lunę periodo, vnam E.ij. æquatoris



PROPÆDEVMATA

æquatoris periodum subtrahe: residuum, illam æquatoris portionem monstrabit, quæ (præter unam sui integram reuolutionē) versus occasum, talis periodi spatio, Directoriē promouetur.

LXXXIII.

**L**icet Solis & Lunæ, generalissimæ fuerint & clarissimæ vires, in hoc Directionū artificio, Reliquorum tamen quinque planetarum (maximè in eorum proprijs significationibus) & Fixarū, multiplices efficientiæ, simili debent obseruari disciplina: tam in eorum diurnis ad meridianos reuersionibus, quàm ad horizontales quoscunque circulos. Nullis autem nos, alijs quàm veris, nunc uti stellarum motibus memineris. Caueant ergo qui vel singulis diurnis planetarū Directionibus vel annuis (de quibus alibi agemus) certam, eandemque præscribunt vel graduum vel minorum quantitatem.

LXXXV.

**P**eriodi diurnæ quinque planetarum, quādo retrogrado feruntur motu, æquatoris periodo sunt minores. Vnde per istos, tum æquatorem, tum alia singula mobilia cœli loca, versus orientem postponi est necesse. Hancque æquatoris periodi anticipationem, Veteres, Directionem conuersam appellabant. Hanc autem tam ad Meridia nos quàm etiam Horizontes referri, non est necesse pluribus docere: aut ex æquatoris periodo, retropedantium

PROPÆDEVMATA

periodum complecti, eundem facit: & ad præcipuum suum denique munus conficiendum (secundum Eclipticę scilicet Longitudinē) multo reddit habiliorem, significamus. PLANETAS ergo, cursu DIRECTO progredientes, generaliter iudicare fortiores, fortunioque quodā affectos, non est à ratione alienum. Vnde motu LATOS VELOCI, certissimū est, plus tū habere fortitudinis, suasque tum scelicius peragere significationes. Quando cum planetarum veloci cursu, etiam concurrat eorundem ad terram propinquitas maior, ex Theoricis constare tibi potest.

LXXXVIII.

**P**laneta RETROGRADVS, Naturæ contra stās decretum quodam modo perfringere videtur: periodum suam diurnam breuiori absoluēdo tempore, quàm ipse Æquator: cuius motus, eò quod citatissimus est, sibi semper æqualis, Temporis sit nobis norma. Secundò, cum ex generali Naturæ instituto, Cœlestia cuncta, in motus diurni ratione, primum sequi Mobile deberent, Retrogradus autem iste planeta, (quasi sibi commissis habentis) suo nisu, primo Mobili aliquam huius sui muneris particulam præripere videtur. Tertiò, ex Diurna sua quaque periodo, aliquam illius vniuersalis Harmoniæ particulam excludit: & post aliquot elapsos dies, notabilem Totius portionem, versus ortum repulisse videtur.

APHORISTICA.

retropedantium periodos diurnas quascunque, auferri debere, cum satis per se sint clara.

LXXXVI.

**E**X IOVIS periodis diurnis, ad æquatoris periodos comparatis, vera patet & physica demonstratio Directionis cuiusdam, ab Antiquis, PROFECTIONIS ANNVAE, nuncupatae: In qua, cœlestia nonnulla loca, per vnum circiter Dodecatemoriū, versus occasum promoueri tradunt. Verum, si vel Profectionis istius partes, ad Iouis verum diurnum motum: vel ipsam annuam Profectionem integram, ad Iouis verum motū in vno anno Solari, referre velis (ut Naturate facere vrgebit) clarissimè tunc cernes, nec directo semper modo ista dirigi: nec eandem esse (singulis annis) graduū multitudinem, quæ vel super meridianos, vel horizontes varios, pro ratione Iouialis motus veri, integræ Profectioni annuæ responderet: Denique non solum quinque vel quindecim loca ita considerari posse aut debere, sed infinita ferè, tam planetarum scilicet, quàm fixarum. &c.

LXXXVII.

**Q**uomodo DIRECTVS Planetę motus, nō solū ad eiusdem maiorem supra nostrū Horizontem exhibendam Moram, confert, esse perpendendū: sed qua etiam ratione, intra suam Diurnam periodū, Harmonicam illam æquatoris

E.iii.

periodum.

APHORISTICA.

bitur: quandamque magnā æquatori Iniuriam intulisse: cum ille, versus occasum, perpetuò rotari debeat. Quintò, pertinax iste planeta, munus suum proprium, præcipuumque deferere videtur. Propria enim cuiusque planetæ periodus, versus ortum absolui debet. Sextò, opportunitatem illam qua ad suas fortius exercendas vires, ut poterat, (ob moram supra nostrum horizontem maiorem) recusare iudicabitur. Nec Solem igitur, neque Lunam (omnium corporearum creaturarum præstantissimas, mundoque elementari beneficentissimas, immò rerum hic omnium quasi Parentes) istis implicari retropedationibus, voluit Deus. Neque reliquos quidē: nisi ad breue quoddam tempus (si ad integras eorū periodos, illud conferas) tali uti tergiuersatione, patitur. Verum nullo cum NATVRÆ VNIVERSALIS incommodo, hoc ab istis patratum. Non magis quàm acerrimæ illæ infinitarum penè rerū Antipathiae, NATVRÆ VNIVERSALIS statum vilo modo labefactant: quin ad gratissimum potius ornatum egregiè faciunt: & ad NATVRÆ perpetuandam incolumitatem, conducunt vel maximè. EX RETROGRADATIONE tamen, particularis aliquis effectus (quem scilicet talis planeta in se receperat perficiendum) interim non promouetur, sed quasi retroagitur: Factaque Infecta fieri videntur. At quis est, qui hæc,

F.i.

tum



tum in Politicis, tum œconomicis negotijs esse necessaria, summeq; interdum vtilia, nō cernat. Satiuscq; esse recurrere (vt dicitur) quā malē currere. Iuuat ergō interdum planeta retrogradus, licet non directo ordine, sed quasi fortuito, & ex abrupto: & in contraria ferē significatione.

89.

**P**lanetæ in maximis suis à Terra distātijs (circa sua scilicet Apogæa versātes) in rebus quarum tunc fuerint proprii Significatores, fortius magnificentiusq; suas exercēt vires, quā in eisdem faciunt, quādo Terræ, circa sua nimirū Perigæa, proximi feruntur. Contrā autem, in alijs sibi subiectis rebus, viuacius efficaciusq; operantur, in sua maxima ad Terrā propiuitate, quā in eisdem operari possunt, quādo à Terra, quā queant longissimē distant. Huius Aphorismi demonstratio ex 4, 43, 73, 77, & alijs prius explicatis aphorismis, maximum suum & lumen & robur habet. Vt ergō in eadem, rerum per eundem planetam significatarū, specie, distinctē exacteq; iudicium proferas, loca maximarum & minimarum à Terra distātiarum, pro vnoquoq; planeta, sint tibi prius nota. Per artificium autem Catoptricum, quinq; planetarum Aliquem, (idq; paucorum dierum Spacio) longissimē à Terra distare facies: Et denuō (ictu ferē oculi) ad Perigæum, quasi Nouum, deducere possis. Quosdam

me

me olim legisse memini, in Sole Lunaq; idem fuisse expertos opus. Sed vidētes, i q; vāfau vbrm. &c.

90.

**Q**uoniam Solis non est semper æqualis potētia, nec eadem significandi ratio: singulorūq; etiam planetarum sint distinctę significationes, ac aliæ aliq; eorundem fiant vires, non debet idem de vniuscuiusq; planetę COMBUSTIONE, pronuntiari Iudiciū. Licet autem Solis excellentissima fuerit & potētissima virtus, nō tamē semper lēdet, dū alium planetā COMBVRERE Astrologi dicūt. Fieri quidem potest, vt ille, Cōbusti planetæ naturā ad amplitudinem quādam & magnificentiam euehat: eiusdem omne ius, in suas vires trāsferēs. Sed dū lēdit, varia est ratio. Ex Graduationū regulis, de quibus suprā, aphorismo 19, egimus, quid sit omni tēpore de tali Cōbustione statuendū (quantum ad sensibilibus radiorum operationem) simplicibus semel definitis planetarum naturis, clarissimē depromi potest.

XCI.

**N**illus est terrestris globi locus, quem Sol, Saturnus, Iupiter, Mars, aut stella fixa quęcūq; nō illustrat suo directo sensibiliq; radio, spatio vnius suarum diurnarū periodorū, dū sub Æquatore, secundum sua vera ferantur loca. Maximum igitur est huius loci priuilegium: ex quo, tantillo tempore, totus terræ orbis sensibilibus directisq;

F. ij.

horum

hōrum radijs illuminari, foueriq; possit.

92.

**D**ve quęcūq; stellę, in locis ANTISCIIIS secundum æquales, & in eandem mūdi partem declinationes positę, æquales supra eundem horizontem verum, acquirunt moras. Et in æqualibus ab eodem Meridiano distantijs, omnes suę radiosę incidentiæ angulos, æquales facient. Vnde per motum Totius diurnum, suis radijs, istę stellę, Terrestrē quodcūq; corpus, per multas vices ita inuoluūt, implicantq; ac si, eiusdem, illis esset similis commissa cura. Ex natura ergo ita cooperantium stellarum, & interualli earundem schematici, siue aschematici ratione, qualis ab eisdem, in (notę constitutionis) proposito corpore, sit generaliter expectandus effectus, inueniri potest.

XCIII.

**L**icet cœlestis cuiusq; Circuli, æquatori paralleli, pars illa, quę sub Meridiano alicuius loci extiterit, (ex omnibus illius paralleli partibus) cum eius loci horizonte vero, incidentiæ angulū faciat maximum: Tamē Eclipticę illa pars solū quę ab horizonte Nonagesima fuerit, altissimē semper supra horizontem eleuabitur. Hanc autem nonagesimam partem rarissimē in Sphæra obliqua, ac in Sphæra recta semper

sub

sub Meridiano inueniri, cuius, vel mediocriter in Astronomicis versato, notissimum esse scio. Hinc in locis, quorum Vertices inter æquatorē & Mundi polos fuerint, illa Eclipticę pars, quę sub Meridiano, quocūq; proposito tempore reperitur, Cor cœli, appellari cæpta est: Nonagesima autem pars ab ascendente loco, Domus decima.

XCIII.

**S**Tellę omnes, vt sunt Luminis participes, ita (præter suorum insensibilium radiorum & specificas suas vires) caloris cuiusdam quo, tantillo efficientes causę.

95.

**V**T SOL singula cœlestia corpora, sua superat magnitudine, Sic cœlestis Luminis quę si fons perennis ac immensus est: calorisq; nobis sensibilis, ac vitalis, præcipuus effector.

XCVI.

**I**llum Calorem, quem Solis radiosī Coni tota Basis (ipso tunc Sole, in sui circuli Perigæo, & in minima Eccentricitate versante) in illud terrenę Superficię naturale punctum, quod tum sui radiosī coni vertex fuerit, tum etiam cui Sol perpendiculariter imminet, efficiendo exercet, (Doctrinę huius nostrę illustrandę gratia) esse potētia cuiusdam, instar Sexaginta, siue Centū graduum, ponere solemus.

F. iii.

XCVII.



**N**on potest ergò nobis ignotum esse, quantum calore suo proprio, aliud quodcunque terreni globi punctum, cui SOL in quouis alio sui Circuli loco, perpendiculariter imminere potest, afficiet: respectu illius sui maximi caloris.

**E**T qui Solis sibi impendentis calorem, in aliqua conuenienti materia aptè experiri nouerit, is, non secundum proportionem solùm, sed etiam secundum rei veritatem, intelliget, quantum calorem omni alteri puncto terrestri, cui imminere potest, impertiet.

**D**ata proportione inter duos caloris gradus, quos Sol in duobus diuersis sui Circuli locis, in terrena loca, illi perpendiculariter subiecta, exercet: Si, quocunque dato tempore, (lucente nobis Sole) per aliquod artificium nostrum, à nobis sensibilibiter excitari potest Calor, qui vni dictorum fuerit æqualis, possibile est etiam, per artificium & industriam nostram, vel eodem momento, vel alio quocunque (Lucente Sole), talem caloris gradum sensibilibiter excitari, qui illi alteri sit æqualis. Ad quantam autem distantiam, hic non est explicandi locus.

**P**er hos eosdem Canones, accuratius examina, quantum

**V**T LVX & MOTVS sunt cœlestium corporum maximè propria, ita inter planetas, SOL, LVCE propria omnes alios superat: & LVNA, proprii MOTVS pernecitate, reliquos omnes vincit. Hi ergo duo, omnium planetarum excellentissimi, meritò censentur.

**L**VNA, potentissima est humidarum rerum moderatorix: humiditatisque excitatrix & effectrix.

**V**T Solis excellentem LVCEM, præcipuum vitalis caloris moderamen comitatur: ita cum LVNAE MOTV, mira quadam analogia, coniuncta est eius vis, humiditatis effectiua & moderatorix.

**L**VNA quò terræ propinquior, & proprio motu, quò fertur velociori, eò suum in res humidas, potentius exercet dominium.

**S**OLEM & Lunam omnium in elementali mundo nascentium & viuientium, tum procreationis tum conseruationis, præcipuas (post Deum) & verè phycas esse causas, ex his sit manifestissimum. Per Calidum enim & Humidum, *πῶντα συνίσταται καὶ ἀναίεται*, (vt philosophi nostri verbis utar). Ista

quantum reliqui planetæ, à Solis virtute calefactiua deficiant, ratione basium suarum Conicarum, respectu alicuius puncti terrestris, cui perpendiculariter imminere possint, in minimis eorundem à centro terræ, distantijs. Istorum bases & distantias, ad Solis basim & distantiam comparabis: & Calores ab istis procreatos intelliges. Hoc tamem memoria tu semper teneas firma: vnumquemque Planetam, ex sui proprii corporis ratione, sensibilem aliam qualitatem, generali caloris commiscere virtuti. Et qualis illa fuerit, non in omnibus solum planetis, sed stellis etiam fixis, (Si 53 aphorismum experiaris) per Lunam expiscari potes: & alijs etiam vijs.

**V**arietas Lunaris caloris, in quodcunque cui perpendiculariter imminere potest punctum, per Solis etiam canones cognosci potest. Scilicet, si non solum eius, à terra distantiam, sed suæ etiam illuminatæ partis conuexæ, quæ ad terram conuertitur, quantitatem, (instar ipsarum conicarum basium in alijs planetis) quocunque proposito tempore examinemus. Non tam aptè tamen Lunares sese (ad operandum) coadiuuare radios, in Corniculari eius figura, quam cum ad orbicularem magis accedat, Cauti & diligentis Astrologi iudicio, relinquo considerandum: vt & alia in istis Aphorismis multa.

Ista enim duo solum, *γινώσκονται* sunt.

**A**nni constitutionem generalem, ex quolibet certè die, per quãdam analogiam, esse demonstratam videmus. Habet enim quilibet Dies naturalis, suum, tum verum, tum Æstatem, tum Autumnum, tum Hyemem. Ex solo ergò Solis calore, per se partim, partim per accidens, omnes præparatæ produci possunt qualitates, & necessario ordine. In quibus, si principia, media, finisque statuamus, Duodenarij cuiusdam rationem cernemus. Et pulchrum est considerare, quo modo tandem sub ipsis Mundi polis, ipse Annus est nisi instar Diei vnus naturalis. Aphorismum istum ad altiora traducas, & maximum Secretum habes, Tu, qui Trinitatis in vnitatem, mysteria tractas phycas: & ad Noctis multicoloris Nigredine, Opus inuoluendum tuum, anhelas.

**V**iginti sex diuersas habitudines, quæ inter fixa sidera & Solem esse possunt, pro diuerso istorum & Solis in quatuor Angulis positu, ad alios etiam planetas transfer: maximè ad Lunam. Sicque consurgunt, ex omnibus planetis, cum stellis fixis, hoc modo comparatis, 182 diuersæ rationes considerandæ. Ex magnæ cõstructionis Ptolomæi, libro octauo, has discas ad Solis habitudines.

**C**orporis imperfectio, proxima & maximè propria Mortis physica causa est, non Anima. Mortis ergo naturalis, causa quoque naturalis: Ex Naturæ igitur generalibus Gubernatoribus, generaliter pēdet & præsignificatur. In Humano certè genere, Nemo ultimum sibi a Deo præfinitum viuendi Terminū præterire potest: Negligētia autem, paucissimi illū attingūt: Duplices vnde cōstat humanæ vitæ esse Terminos.

CX.

**A**nima humana, & Forma vniuscuiusq; rei specifica, multò & plures & præstantiores virtutes, operationesq; habet, quàm vel ipsū Corpus, vel eiūsdem rei Materia.

CXI.

**I**nsensibiles, Intelligibilesue planetarum radij, ad eorum sensibiles, sunt instar Animæ cuiusdā ad suum Corpus.

CXII.

**S**iderum quædam, eatenus **M A L E F I C A** aliquando vocantur, quatenus eorundem vires in corruptā Naturam, vel malè dispositam Materiam inmittuntur: (Hoc nos docente Aphorismo Septimo) Ipsa enim Sidera, per se, nihil operantur mali.

CXIII.

**O**mnium rerum in mūdo elementari existentium,

do solum duo ex septem, copulantur, 21 variæ esse possunt coniunctiones: & in illarum singulis, quis duorum planetarū fuerit fortior, considerari debet. Ex duorum ergo coniunctione, 42 diuersæ oriūtur considerationes: Eademq; ratione, ex triū corporali coniunctione, 210: ex quatuor, 840: ex quinq; 2520: ex sex, 5040: & ex septem, 5040 variæ cōsiderationes prouenire possunt. Qui omnes considerationum modi, sunt 13692: qui tantū ex corporalibus planetarū coniūctionibus pendent: eorum etiam viribus, generalissimè tantum, & nō ad certos gradus (vnde innumera ferè myriades, considerationum variarum, procrearentur) suppositis esse inæqualibus.

CXVII.

**P**enitus Naturæ virtutes introspicientes, eorumq; etiam, quæ superius, clarissimè varijsq; modis, confirmauimus, satis memores, circa vniūquamq; mundi rem, omnium septem planetarū radios, secretioris influentiæ, aut sensibiles principales vel accidentarios, omni tempore concurrere, commisceriq; , certissimum esse asserimus: perpetuamq; horum omnium, in rebus mundi omnibus (effectuum certè naturalium ratione, licet non secundum ipsorum vera in Cælo loca) manere coniunctionem. Vnde si inæquales semper eorū essent vires, Natura 5040 modis varijs generalissimis, eorū posset dispensare operationes,

tium, quæcunque fuerit diuersitas naturalis, ea ex duabus præcipuè procedit causis: scilicet ex Materialium diuersitate, & varia stellarum radiorum operatione.

CXIII.

**O**mnis res, quantumcunq; exigua, in mundo elementorum existens, totius cœlestis Harmoniæ est Effectus: siue Exemplū quoddam & Imago. At in quibusdam rebus, hoc clarius quàm in alijs apparet.

CXV.

**E**X ANALOGIA corporum cœlestiū, tam in seipsis, variè consideratorum, quàm inter se mutuò comparatorum: & illorū omologa semper, in isto Elementorum regno, (ex arte à nobis suprā tradita) accuratè secernendo, amplissimam tibi viam, ad perfectam Astrologiæ sapientiam, sternes.

CXVI.

**Q**uoniam Septem planetæ, 120 diuersas Coniunctiones nobis exhibere possunt, (scilicet dum binī coniunguntur, 21: dum terni, 35: dum quaterni 35: dum quini 21, & dum seni, 7: & dum omnes simul copulantur, 1) verissimèq; summus dicter philosoph⁹, quòd ἐν αὐταῖς κείται ἡ γυνῶσις τῶν γενομένων ἐν τῷ κόσμῳ, τῆς γενέσεως καὶ τῆς φθορᾶς: Circa illas 120 Coniunctiones, generalissimam hanc nos proponimus Methodum. Quando

G.ij. do

nes, quantum ad virium differētiās. Verum, si interdum duos, æqualibus fortitudinis numeris affici, interdum tres, interdum quatuor, interdum quinq; , interdum sex, & interdum omnes (licet rarissime) consideremus: æqualitatemq; istam vel in supremo vel infimo, vel intermedijs posse inueniri gradibus: varios inde modos, per methodum prius explicatam, eliciemus 20295: quibus si iūgamus inæqualitatis absolutæ modos 5040, confluent modi 25335, generalissimi quidem: in quibus per Graduationū regulas, philosopho est dignissimum exerceri: vtilitatem enim reportabit, & voluptatem immensam. Et quò istorum duorum Aphorismorum veritatem, rationemq; Logisticam intelligas, praxeos nostræ quandam formulam tibi preponemus, in multis alijs etiam rebus vtilissimam. Facileq; poterit industrius artifex, hanc Methodum ad infinitatem quandam extendere: & non pati in Septenario solum consistere numero.

Praxeos Formula.

G.ij.

Pri Aphorismo



PROPÆDEVMATA

Pro Aphorismo CXVI.				Pro Aphorismo CXVII.			
1	1	0	0	0	7	5040	
2	2	21	42	2	6	15120	
3	6	35	210	3	5	4200	
4	24	35	840	4	4	840	
5	120	21	2520	5	3	120	
6	720	7	5040	6	2	14	
7	5040	1	5040	7	0	1	





[This is a translation of the 1558 Title Page]

Translator's Note

*Propaedeumata Aphoristica* by John Dee

Translated by Jim Egan

guided by the original translations  
of Scott Barker (2009) and Wayne Shumaker (1978).

To put it simply, this book is about the geometry and arithmetic that connects Astronomy with Astrology. *Propaedeumata Aphoristica*, or “Preparatory Aphorisms” is meant to be an introduction to Dee’s grand exposition of his cosmology, the *Monas Hieroglyphica*. Not only does it prepare the reader to understand what the heck the *Monas* is generally about, but it includes specific clues (strewn about in various places).

This translation is based on a preliminary translation by Scott Barker, with firm guidance from the 1978 translation by Wayne Shumaker (and essay by J.L. Heilbron.)

My main goal is for this fresh translation to make a clear path between Dee’s mind (in the mid-1500’s) and the modern mind (in the 2000’s).

Though the work seems lengthy, Dee gave great consideration to every word of every sentence. To capture and communicate that intent to the modern eye and ear, I have taken some liberties.

Lengthy paragraphs have been split into smaller ones to make them bite-sized and allow for breathing room. Words whose chief meanings have dramatically changed over the past 450 years have been replaced with modern-day equivalents. Parts of sentences have been rearranged to give them better flow.

Commas and parentheses have sometimes been added for the sake of clarity. However, all words in parentheses belong to Dee. [All my comments, clarifications and definitions are in brackets.] Dee’s frequent Capitalizations have been maintained, as he uses them for emphasis.

The Roman Numerals of the Aphorisms have replaced with Hindu-Arabic Numerals (but be sure to look at to Dee’s Latin original mixture of both systems, because he has hidden a mathematical puzzle in his arrangement).

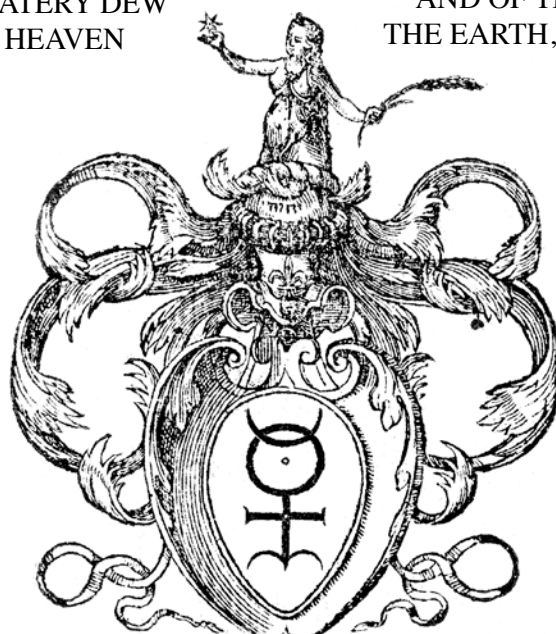
# PREPARATORY APHORISMS

JOHN DEE OF LONDON

Regarding Certain Excellent  
Virtues of Nature

THE WATERY DEW  
OF HEAVEN

AND OF THE FRUIT OF  
THE EARTH, HE WILL GIVE



QUATER NARY  
RESTS IN THE TERNARY

London

In the Year 1568

*[This Title Page and all the following pages are translations of Dee's 1568 second edition]*

*From the Author to the Reader*

*I present to you, Sincere Reader; this second edition of these Aphorisms  
corrected by the hand of the Author himself and printed most accurately.*

*The edition published in the Year 1558*

*(as you can easily see by comparing these works)*

*was imperfect in many places because  
of the negligence of the printer.*

*Enjoy and use them profitably.*

*Farewell.*

*In the 1567<sup>th</sup> year from the Virgin birth*

*In the Month of December,*

*In London.*

To that most renowned gentleman  
**Gerardus Mercator of Rupelmonde**

distinguished Philosopher and Mathematician  
(as well as my dearest friend, by far)

**John Dee of London**  
Sends Many Greetings



It has been eleven years (my most humane and learned Gerardus) since I left the Academy, having run through everything professors can teach students about the seven arts (so called liberal).

Swimming without cork (as the proverb says) [without a life-preserver] I began to travel to Regions across the seas to investigate the sources from which (in our age) many channels of the best of these Arts have been led to us.

I have lived on familiar terms with men whose most casual single day of writing would have been provided enough material that, if sitting at home, would have taken me a year to comprehend.

By the highest favor of God, I was able to meet you at the beginning of my travels, while we were pursuing studies in Louvain. It is from your discussions with me that my whole system of philosophizing in these foreign domains laid down its first and deepest roots. Therefore I now think it's only just and reasonable that you as a first traveler should be the first to lay claim to my labors.

This is a right you deserve most of all, as it was the custom of our shared friendship and familiarity that, in that whole 3-year period, we didn't willingly lack each other's company for as much as 3 days.

We were both so eager to learn and philosophize that when we met we scarcely left off our discussions of difficult and useful things for 3 minutes of an hour.

For the sake of such a sincere friendship and sweetly continuous cooperation in philosophizing, should we not commit to the eternal memory of men some syntagma [Greek for a collection of well-arranged writings], or monument, so that a later age of scholars might be motivated by its considerations resulting from that most sweet bond of friendship by which we are perpetually joined?

Neither of us ever criticized the other's pursuits nor were either of us envious of the others learning, but instead we put our heads together for seeking out truth and the expansion of useful sciences.

In your next to last letter, you reminded me of that noble debate we once had. This gives me the opportunity to discuss the matter at hand.

I had hoped to write a longer explanation (or rather demonstration), but my health, which has been perilously shaken for a whole year now, has not permitted me to (even though I wished it). But the Discipline itself, the power of the Heavenly virtues, doesn't seem to require a lengthy explanation. From what I have written, one can find a way of proceeding to find *Apodixes* [Conclusive Proofs] in the Art, with regards to an infinite number of specific situations.

I have presented and established the foundations of this discipline in a way that other principles of the Art will be readily apparent to the diligent artificer.

I have ignored the infinite *anaitiologêtas* [Greek for “things that cannot be analyzed”] and the useless decrees of many who cannot support what they write about with reasonable explanations.

No one can start to understand the powers of Nature simply by observing them. To you who are accustomed to be Devotees in observing NATURE: be observers of the true virtue of NATURE in these Aphorisms. These virtues are great, but they are hardly believable, except to a few Wise Men, and are known by even fewer.

When you RECEIVE this work, I ask that you publicly declare that no *tôn amnêton tis*” [incautious or thoughtless person] should attempt to search out and draw out (to his own harm), things that were not written for him. But enough of this.

In nearly all your letters (which I have here at hand), and especially that next to last letter (mentioned previously), you have encouraged me to publish my *Apodictum* [Conclusive Proof] of this new Art (as you call it) as soon as possible (or at least to share it with you).

You should be aware that besides the extremely dangerous illness from which I have suffered for the last year, I have had many other inconveniences (from those who ...) which have hindered my studies. [Probably dealing with the false accusations made against him.]

At weakened strength, I have not been able to sustain my burden, the Herculean task of finishing my work.

Thus, if my work cannot be completed or published while I can still be a witness to it, I have entrusted it to the most learned and eminent gentleman, the sole relic, the only prop and ornament of the Mathematical Arts that is still alive, D.D. Pedro Nunes of Salamanca. [Shumaker suggests D.D. stands for “Dominus Dominorum” or “Master of Masters.” This famous Portuguese mathematician wrote extensively on navigation, astronomy, cosmography, and algebra.]

Recently I appealed to him to kindly and humanely adopt this work if it was brought to him after my death. He is to use his own judgement in completing, correcting and polishing it (as if it were his own) for the public use of Philosophers, .

I do not doubt that he will become a partaker of my wish (if his life and health remain unimpaired), as he loves me faithfully. He has a natural inclination, strengthened by his will, industry, and practice, to apply himself diligently to the Arts most necessary to the Christian Republic.

I have clearly explained enough about why I have been unable to satisfy your wish that the monuments of my labors be published. However, if I were not to respond to your request to provide a Catalog of my writings, you might justly accuse me of grave ingratitude.

There are the Titles of the works I have composed for myself with what means I have and despite the greatest of difficulties. They are listed in the order I most wish them (when I have more bodily strength and enjoy sweet leisure) to be issued to the public (so they are not known only by me).



1. ***Peri Akribologias tês Mathêmatikês*** (a work of mathematical demonstration in 16 books)  
[loosely translated this means Precision in Mathematics]
2. **The Distances of the Planets, Fixed Stars and Clouds from the Center of the Earth and the Discovery of the True Magnitudes of all the stars** (a demonstration in 2 books)
3. **Burning Glasses**, (a demonstration in 5 books)
4. **Perspective Used by the Most skilled and Famous Painters** (a demonstration in 2 books)
5. **The Third and Chief Part of Perspective, which Treats the Refraction of Rays**  
(a demonstration in 3 books)
6. **The Great Conveniences of the Celestial Globe** (2 books)
7. **The Mirror of Unity, or Apology for English Friar Roger Bacon**, in which it is taught that he did nothing with the aid of Demons, but was among the greatest of Philosophers; and that he accomplished great feats naturally and in ways permitted to a Christian man which the unlearned crowd often attributes to the acts of Demons. (1 book)
8. **A New System of Navigation** (2 books)
9. **Various Uses of the Astronomical Ring** (100 chapters in 1 book)
10. **Subterranean Tunnels** (1 book)
11. **The Triangle and the Analogical Compass** (3 books)

[in Dee's earlier 1558 edition, the eleventh book was *peri Anabibasmon Theologikon*,  
loosely translated this means "Fundamentals of Theology"]

I shall remain silent for now about the names of other works which may (God willing) enjoy the public light before some of these. This little work (Number Twelve) I send forth into various regions like an Explorer. Hopefully it will return to me the true judgements of learned and honorable men and their requests that I treat these matters and bring their proofs to light.

Depending on the report from my learned friends that the Explorer brings back, I will decide whether I should lead my forces into foreign fields or have them stay home and train themselves even more diligently in military discipline.

Gerardus, it remains now for me to urge you to commit to the public studies of men (as soon as you can) your own wonderful Discoveries in that most excellent part of Philosophy which is called Physics, as well as your works in Geometry and Geography.

With these most useful and new Discoveries, you will immediately enlarge the Republic of Letters (something you have deserved so much by your many years of hard work).

Farewell, and May the Good and Great God bestow fruitful results on your most excellent undertakings. Again, farewell.

*London: July 20, in the year 1558 after the birth of our Redeemer*

*To the reader*  
*who is eager to learn honest Philosophy*

JOHN DEE OF LONDON

Sends Many Greetings.

[Dee's introduction specifically for the 1568 second edition]



Here are our Aphorisms, published for you with some revisions, but unchanged in their number, order, and subject matter. Indeed, I realize that these Aphorisms are for the more Advanced.

Those of you have not progressed as far in your understanding of the many great sciences may find them rather long and difficult. He who turns to them from the Common and well-worn way of philosophizing (Poor Fellow) will immediately exclaim that he is lost in a confused Labyrinth.

I have here entrusted for your studies an assimilation of everything I have been able to understand, figure out, discover, hear and see (by reading, meditating, testing and through traveling) concerning all the remarkable things that have ever been put forward in the Theories and experiments of all the Ancient and true Philosophers.

All these things, or actually the Choicest parts, have been HARMONIOUSLY CONGLOBULATED INTO ONE SOLID BODY.

[Dee writes "harmoniously" in Greek, *armonikos*, to allude to the wisdom of the Greeks; Conglobulated is a rarely used word, but is in English dictionaries. *Con* means "together" and *globulus* means "in the form of a globe." Dee sees all the various parts of his cosmology working together harmoniously in a solid, spherical whole. And he is emphatic about it, as can be seen by his full capitalizations.]

Besides the most Illustrious Discoveries of our ancestors, this *Syntagma* [composition or body of work] is packed with Wonderful and Honorable ornaments. You will certainly find them if you search diligently, through repeated readings (paying close attention to and pondering certain things in particular). Nevertheless, you must not openly reveal to the unworthy or the profane all this which, driven by my desire to illuminate and enlarge the truth (so that it will be apparent only to you), I have stretched the sinews of my little talent to make evident, lest (to your shame and mine) it be turned to great harm. Farewell, friend. Pray wish my soul well.

*From our Library at Mortlake*

*Year 1567, December 24*



John Dee of London,  
*Preparatory Aphorisms*  
on the most excellent virtues of Nature



1.

Against the laws of reason and nature, God created all things from Nothing. Thus no created thing can ever return to Nothing, unless it is done through the Supernatural power of God and against the laws of reason and nature.

2.

In actuality, if we artfully push Nature, using the Principles of pyronomia, we may produce marvelous Metamorphoses. By Nature, I mean any Thing that has been Created.

3.

Things which are visible and are known to perform in a certain way in the nature of things are said to Exist.

But wise men can demonstrate there are other things which exist in Nature's hidden recesses which act somewhat like seeds.

4.

Anything that actively Exists sends out its Rays in all directions, elegantly filling all the various parts of the universe.

Thus every place in the Universe contains rays of all the things that have an active existence.

5.

Both the general Substance of a thing and its Specific Individual Characteristics emit their own likenesses, but the general Substances of a thing radiate far more effectively.

Of these general substances, those which are incorporeal and spiritual (or become Spiritual) far surpass those which are corporeal (and composed of flowing elements) in this radiating function.

However, things may emit their own Likenesses less completely the more excellent they are. For a perfect Likeness is given the same name as its principal agent.

6.

Just as one thing differs from another, the rays of these things differ in their power to produce and perform their effect (provided they are working on the same thing).

7.

The same rays, emanating from the same substance, can cause different effects in different things.

8.

Sometimes a thing will act upon another thing which is similar in some respects. Other times it will act on something that is quite dissimilar.

And sometimes there is no action at all.

9.

Whatever is in the universe has agreement, accord, and similar form with something else.

10.

Things that are of the same order or are harmonious or of similar form sometimes imitate each other of their own accord. Sometimes they move towards each other's location.

One protects and defends the other (as much as possible) even if they seem to be drawing strength out of each other.

Thus, through the Activation and Union of these natural things (with their differing manners), and also through more excellent, superior things which are like the Seeds of Nature, more marvelous things are able to be shown, truly and naturally, than any mortal could ever believe. (And all this is done without violation to faith in God and without causing any harm to the Christian religion).

11.

The whole world is like a lyre which has been skillfully designed by a most excellent artificer.

Its strings are like Separate Parts of the universe. He who can pluck them dexterously will be able to bring out wonderful harmonies.

Man, in himself, is wholly Analogous to this Lyre of the World. [Dee sees a human being as a Microcosm of the universe.]

12.

A lyre is an orderly arrangement of harmonious and disharmonious tones, perfectly suited to express the sweetest and most wonderful harmonies, with infinite variations.

In the same way, the World is an orderly arrangement of its many parts. Among some of these parts the closest sympathy can be observed. But among others, there is harsh dissonance and noticeable Antipathy.

When combined, the mutual concord of one and the strife and dissimilarity of the other produce a common Whole, a Union worthy of admiration.

13.

Our senses are not the causes of perceivable rays which flow from things, but instead are the witnesses of them.

14.

Spiritual likenesses as well as natural likenesses flow from things to us by way of light (through our sense of sight) but also without the use of light (through our other senses) [hearing, smelling, tasting, touching.]

Particularly in the Spirit of our imagination, things present themselves to us as if in a Mirror, and produce amazing things within us.

15.

No motion is more perfect than circular Motion. Nor is any quality exposed to the human senses more outstanding and extraordinary than LIGHT. Thus, these two will be especially characteristic of the most excellent and most perfect bodies.

16.

Whatever is in the universe is being continuously moved by some Effect of motion [from other things].

17.

All earthly things are ordered, set in motion, and continue to be moved by the prime motions, which are most characteristic of the Celestial bodies.

However, even Celestial bodies sometimes move up, or down, or forwards, or backwards or sometimes towards one pole of the World (or the Ecliptic) and sometimes towards the other pole.

18.

In each of the four separate great Wombs of the Larger World [Majoris Mundi magnus Matricibus] are three different parts.

However, at the same time, these parts take form and are equitably shaped by their own considerations.

They may be called by Notariacal design:  $\dot{A}\dot{O}\dot{S}$  or  $\dot{O}\dot{S}\dot{A}$  or  $\dot{S}\dot{O}\dot{A}$ .

(Pyrologians will understand what I mean.)

[Notariacal means when a letter stands for a word]

Learn as precisely as possible the natural properties of these Three and what they produce naturally.

Learn not only the primary, but also the secondary and tertiary productions.

And also learn the way of restoring the tertiary to the secondary and the secondary to the primary.

In the same way, you should give the greatest consideration to why the very same part may be the cause of not only differing effects, but sometimes opposing effects.

19.

When two, three, or four Elements are mixed together (in any quantity), you should endeavor to learn the true nature of the composition's Complexion [interrelationships] and Temperment [proportionings] by using what is called the art of Graduation.

20.

The Astrologer should investigate (to the best of his ability) the proportions of the elements in the various parts, humors, and spirits of the human Body. It is important to test the proportions of the elements in other natural objects, as the conclusions you reach will be quite rewarding.

21.

Potentially, every Seed has within itself the whole and constant order of each generation.

This orderliness is influenced by a combination of the place of the Seed's conception and the various powers in the Overarching heavens above that place.

22.

It is the privilege of the prime motion [the first motion of the heavens] that without it, everything else would be motionless.

A similar thing is true about the power of the prime [first] and most special perceivable Form which, most certainly, is LIGHT. None of the other forms could do anything without it.

23.

What philosopher does repeatedly sing this song: "Thoughts exist through bodily perturbances, so they obey bodies. They should not be grouped with things that cannot be perceived." [Dee writes this in Greek]

What mortal doesn't experience this nearly every day?

Everyone knows that the "Body is sensitive to the sufferings of the Soul." [This is also in Greek]

The Physician heals and regulates the soul through the body, but the Musician heals and controls the body through the soul.

Thus, he who is able to provide the many services of a doctor and of a musician will be able to govern the bodies and minds of men, almost as he wishes.

(Certainly discreet Philosophers will keep this a secret).

24.

What God has revealed clearly to the eyes of mortals in a Magnet, he has left to be discovered in other things through the more subtle investigations by the mind and through diligent experimentation.

First, I will remind you of its power to attract. Second, of its power to repel and separate. Third, of its power to orient itself in a certain direction [as in a compass]. And fourth, the ability of its rays to pass through solid objects. I shall explain other wonders of this stone of the Philosophers at another time (God willing).

25.

All stars radiate two kinds of rays. Some are luminous rays that can be experienced by the senses, but others have more Secret Influences.

This secret kind of ray instantaneously penetrates everything in the universe. But there are ways that the luminous kind of rays can be prevented from penetrating too much.

26.

The powers of the stars and celestial objects are like Seals whose characters are imprinted differently on various types of elemental material. The engraved forms of our seals are imprinted more easily and elegantly on one material than on another.

They cling more tenaciously to one material than they do to another, sometimes almost permanently. Thus you should consider Gamaaeas (and far greater things) more attentively. (Gamaaeas are a talismans—inscribed rings, seals, or stones with special powers)

27.

The power of celestial rays to penetrate everything that exists in the universe (whether the thing is transparent or solid) proves their great ability to influence and impress their energies on everything.

This might happen with such fastidiousness that the imparted power will be retained with much tenacity, in some instances almost permanently.

Thus, the material upon which the influence is to be impressed should be naturally arranged and artfully prepared (with respect to its visible form, its elemental qualities, and other properties.)

28.

The primum mobile is like a spherical concave mirror that is so solid it cannot be penetrated by sensible rays from the stars. Such a penetration would serve no purpose for celestial things. (There are several other demonstrations of this.) [In the Medieval version of the Ptolemaic system the primum mobile is the outmost sphere that moves around the earth in 24 hours.]

29.

To apply their useful effects, the stars exercise their strength not only by direct rays, but by refracted and reflected rays as well.

30.

The astrologer should not only know the true size of the terrestrial globe, but also the sizes of the various planets and fixed stars.

31.

The astrologer should also know the true distance from the center of the earth to each of the various planets and fixed stars (and how these distances vary at different times). He should also study the varying altitudes of the clouds (or of the thicker air) above the earth.

32.

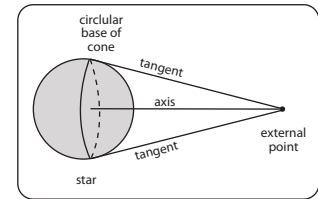
It is of prime importance to be able to determine which fixed star or wandering planet is located perpendicularly above a particular place on earth (for any given moment in time.)

The angle which that star or planet makes to other places on earth (from which the star or planet is visible) should also be known.

33.

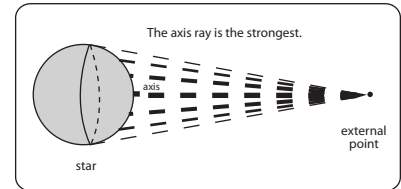
Every perceivable ray emanating from the body of a star to some external point is part of a large cone of perceivable rays emanating from the star. The Vertex of the cone is the external point. The Axis of the cone is the ray. And, finally, the Base of the cone is the luminous part of the convex surface of the star nearest to the external point.

The boundary of the cone is a circle described by the end of a straight line (drawn from the external point vertex to the star) but which barely touches the star itself [in other words, is tangent to the star].



34.

Of all the rays flowing from the luminous base of any star towards the external point, the ray on the central axis is the strongest. With regard to the other rays, the closer they are to the central axis, the stronger they are. (We will speak about the rays coming from deep within the stellar bodies in another place.)

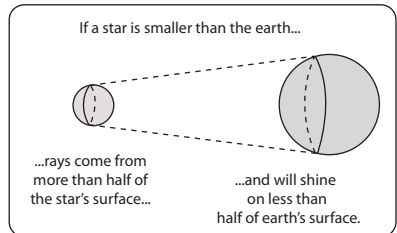


35.

From Stars that are smaller than earth, all their direct, perceivable rays (which shine on as much of the earth's convexity as possible) emanate from more than half of the convexity of the star.

And these rays will only shine on less than half of the earth's convexity.

Regardless, the strength of the rays is based on how close the star is to earth.

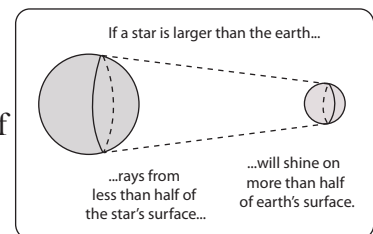


36.

Any Star that is larger than earth will shine its direct, perceivable rays onto more than half of the earth's convex surface (at any given time).

Also, the rays they send to earth come from less than half of the star's convex surface.

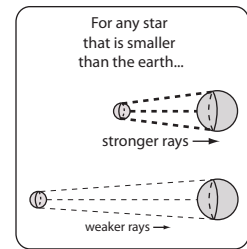
Even though the rays come from a smaller portion of the star's surface, their strength is still based on the distance between the star and the earth.



[Dee does not actually illustrate these Aphorisms. These drawings encapsulate what he appears to be saying]

37.

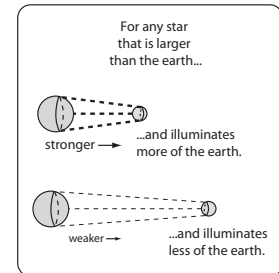
For any star **smaller than earth**, (even though a small portion of the earth is affected by its direct, perceivable rays) it will pour stronger rays of Light when it is close to earth than when it is far away.



38.

All stars **larger than earth** impress their rays stronger the closer they are to earth.

Also, the closer they are to earth, the larger portion of earth will be illuminated by their direct, perceivable rays.

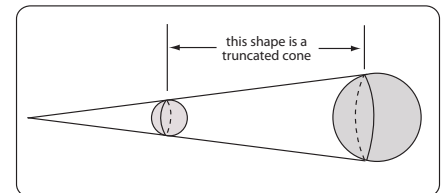


39.

Regarding the portions discussed in propositions 35, 36, 37, and 38, you should consider with the greatest diligence the actual amounts of Surface area of the Spherical convexity of both Earth and the star involved.

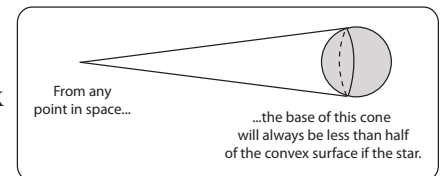
These areas are bounded by the edges of a truncated cone which is tangent to both the earth and the star.

(Consider the various relative sizes of earth and the star as well as their distances from each other.)



40.

If a cone is made from a spherical star to any point in the universe, the base of that cone will always be less than half of the convex surface of that star. Astronomers should take this into consideration when attempting to measure the diameter of the star.



41.

The Closer a point in the universe is to a star, the smaller the base of that cone will be. The Farther the point is from the star, the larger the base of the cone will be.

42.

You should investigate the various sizes of the bases of these cones (for any position of any star) with respect to any external point in space.

43.

In certain respects the luminous rays from long Cones are stronger than those from short cones, but for other respects they are weaker.

Long cones have larger bases and smaller angles. For these two reasons, the following principle arises: In longer cones, the many rays (not only incident, but reflected) are more concentrated, thus they exert a greater force.

However, because of the natural and simple fact that an agent is more powerful the nearer it is, short cones are more powerful than longer ones.

44.

Accurately determine what proportion of the Moon's convex surface (which is facing us) is illuminated, at any given time.

45.

What we call our true horizon is that circle which is described by the rotation of a line whose end-point is the center of the Earth and whose other end-point is situated in the farthest reaches of the sky, in such a way that a straight line connecting our zenith and the center of this circle will be perpendicular to this circle.

However, our actual Perceivable Horizon (as I have shown elsewhere) is that convex portion of the terrestrial sphere which is visible to us (having removed all impediments above the uniform curvature of the earth).

This horizon is bounded by the circumference of a circle drawn by a straight line extending from our eye to the remotest part of earth we can see.

(I have also explained previously that the visible horizon will vary with the height of the viewer).

Many things depend upon this consideration and experts will appreciate that it is very important in Optics, Astrology, and in the science of the Magi.

*porisma* [corollary]

In most cases, a True Horizon can be made using 2 points in the universe and the center of the earth [three points define a plane]. But if the two points in the universe and the center of the earth all fall in a straight line, there are an infinite number of True Horizons.

46.

Any star larger than earth sends perceivable rays to us from some portion of themselves before their centers rise to our True Horizon.

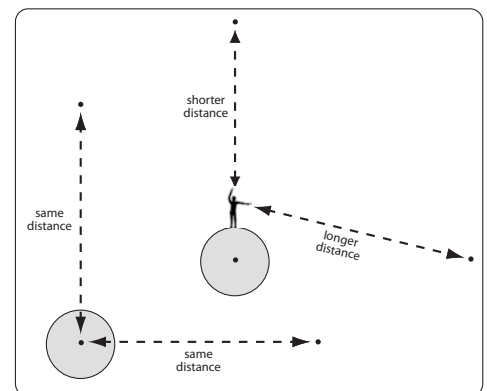
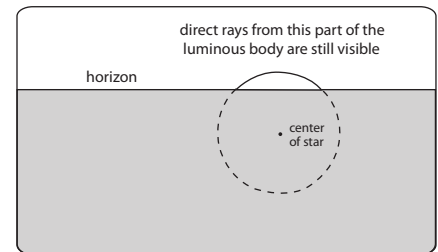
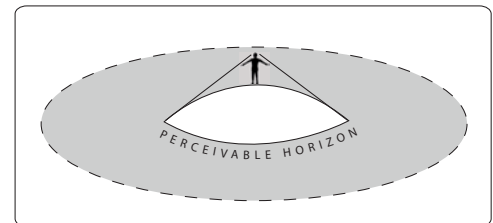
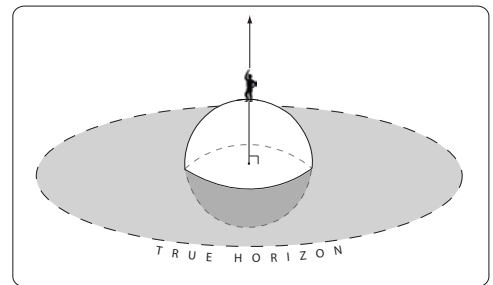
For the same reason when a star is setting, and its center has gone below the True Horizon, part of the star can still illuminate us with its direct rays.

47.

The distance from the center of the earth is the same all the time. However, from any earthly place, the star will be further away when it is on the True Horizon than it will be when it is above the horizon or overhead.

However, the Sun is different. When the sun rises to be overhead in the beginning of Capricorn [around December 21], it is much nearer to us than when it turns in Cancer [around June 21]. This is because of the greatness of its eccentricity, which is also changeable.

[aphelion (the closest earth-to-sun distance) is actually around January 4 and perihelion (the farthest earth-to-sun distance) is actually around July 4]





48.

When the sun is below our True Horizon, it provides rays of subsidiary light to us through the air, as by the brightness of twilight.

In the beginning of the morning Twilight, when the Three Superior planets [Mars, Jupiter and Saturn] and many of the fixed stars are hidden under the horizon (even more than the Sun itself) they will communicate the power of their subsidiary Light to us as if they had their own twilights (though hardly as perceivable as that of the Sun).

I propose that the Inferior Planets [Mercury and Venus] should also be considered in this way. This happens (as I said) not through any principal ray (meaning direct, refracted or reflected) but through what philosophers skilled in optics and catoptrics call Reflections of Reflections.

Investigate why Solar Twilights are not all the same and study the Twilights (as we now call them) of the other planets.

49.

Investigate why the fixed stars and various planets (either below or above the horizon) reflect to us (or to other places on earth) rays of their own light not only from the heaven itself but also from the air, clouds, water, mountains and similar bodies.

Observe and contemplate the wonders of the many fracturings of the heavenly rays in the air, the clouds, and the water and you will be impelled to praise the infinite goodness and Wisdom of God.

50.

God has given every star its own name. Each star has its own unique nature and virtue which can never fully be found in any other star.

51.

At any given point in the universe, and at any given time, there is a particular arrangement of the rays from all the planets and fixed stars.

No identical arrangement can exist at any other location (not even at the same location at a different time).

52.

If you are skilled in Catoptrics [the study of mirrors and reflected light] you will be able to artfully impress the rays of any Star much more strongly upon any given material than Nature does by itself. Indeed, this was by far the greatest part of the Natural Philosophy of the Ancient Wise Men.

And this Secret is no less dignified than the most distinguished ASTRONOMY of the philosophers commonly called INFERIOR. The symbols used in Inferior Astronomy are incorporated in a certain MONAD which is derived from our Theories and which we send along with this little book.

[Dee is sending Gerardus Mercator his Monas symbol, presumably with a preliminary explanation, as Dee tells us his mind was “pregnant” with the *Monas Hieroglyphica* for 7 years, from 1557 to 1564.]

### *porisma* (corollary)

Obscure, weak and (as it were) Hidden Virtues of things, when strengthened by the Catoptric art, can become more apparent to our senses.

The diligent Investigator of Secret has this great assistance available to him when examining the particular powers, not only of stars, but of other things that the stars affect with their perceivable rays.



53.

Anyone who wants to understand about the effect of the Sun's light on the Moon, or what the Moon can do on its own (not including the Rays of the sun), can learn by studying the full moon and the period of darkness during a total eclipse of the moon (and using the art of catoptrics).

(It is not necessary to point out how this same mode of experimentation can be used in solving other problems).

54.

The closer the radiant axis of a star is to being perpendicular to any elemental surface, the stronger it will impress its forces on that location. It affects that location with direct rays (because of the nearness of the star) but also by reflection (because reflected rays are closely joined with the direct rays).

[Shumaker suggests this last phrase refers to star rays that are reflected off the "shell" of the primum mobile and then rebounded to earth.]

Measuring the eccentricity of various places in the Zodiac can show us which planets are closest to us since they will make an acute angle of incidence with our True Horizon (or some other surface).

But we have spoken about this earlier. Now we will declare this general aphorism regarding equal distances from earth. Contemplating the reason for this exception in various places within eccentric circles is both useful and rewarding

55.

With any star above the horizon, the longer it Pauses, the easier it is for its direct rays to leave a strong impression of its power.

56.

O! The many different ways these 3 factors (Proximity, Angle of Incidence and Pause) can combine makes for a wide range of possible strengths of any given star (above the horizon).

57.

Any given momentary state of the heavens combines an infinite number of effects which direct and impress their forceful strength in the Seeds of events happening at that time. (These seeds will eventually ripen under the influence of other constellations.)

58.

Of all the heavenly motions, the swiftest is that which the circumference of the equator makes towards the west in the space of twenty-four equal hours. This is commonly called the Diurnal [Daily] movement of the Whole.

59.

The closer parallel circles are to the equator, the closer their speed is to the speed of the equator.

60.

The ratio of the lengths of the circumferences of any two circles parallel to the equator is equivalent to the ratio of their velocities (as they proceed in the Daily motion of the Whole).

Apply this idea to other planets and fixed stars (with regard to their own daily arcs).

Furthermore, the ratio of these circumferences is also equivalent to the ratio of the Diameters of their Circles.

61.

We should observe and carefully note the periods of the celestial bodies as they move by the power of NATURE in accordance with inviolable laws.

By PERIOD we mean the complete return of a planet (or a fixed star or any celestial point), by circular motion, to the place where it started (or as close as possible). The time it takes to make such a Revolution we call a Period.

62.

From Nature we receive all these most important circles: the Horizon, the Meridian, the Equator (and all the circles parallel to it), the Ecliptic, the Eccentric orbits of the planets, the Epicycles, and others.

I recommend these be precisely learned from the theoretical and Astronomical Canons of the planets.

63.

Any circle might be considered what is commonly called a Circle of Position. Any circle is a circle of position of another particular place. (Actually every place has an infinite number of horizons or circles of position.)

Most places on earth have 3 main types of Circles of Position used in describing Celestial Themes [for drawing horoscopes]: its meridian [longitude line], horizontal circle [latitude] and a circle which cuts the length of the ecliptic at a right angle.

On the poles, there are only two of these three. [The latitude circle at the pole is a point]. And on the equator there are only two [the circle which cuts the ecliptic at a right angle is also the longitude line.]

Thus, there are an infinite number of ways Nature combines its forces.

64.

An equatorial period is the time it takes for some point of the equator, (or, actually, any celestial point), return to the same meridian. This daily motion of the Whole is completed in the space of twenty-four equal hours. As this period is always the same, it is the simplest of celestial periods.

65.

A natural day, or the diurnal period of the Sun, is the time that passes while the center of the Sun is brought back to the same meridian by the diurnal motion of the Whole. Indeed, this period is of very unequal duration.

66.

The time it takes for the Sun to return to the same point in the great ecliptic is called the tropical year of the sun. [in Greek, *tropos* means “a turn”]. In our age its length is observed to be 365 days, 5 hours, 55 minutes, and about 20 seconds. (However the most accurate observations of the best Mathematicians show that this length varies over time.)

67.

The time it takes for the Sun to return to the same fixed star (or the same distance from a fixed star along the length of the ecliptic) is called the sidereal year of the Sun. [in Latin, *sidereus* means “belonging to the stars”]

Thabit [Thabit ibn Qurra, Arab astronomer, 836-901 AD], the Son of Chora, found the sidereal year to be 365 natural days, 6 hours, 9 minutes and about 20 seconds. However, Copernicus has shown that in our age a sidereal year is longer by about 20 seconds.

68.

By making an accounting over a long period of time, determine the true length of the lunar period, both in relation to the longitude of the ecliptic and in relation to the Sun. These two kinds of periods are quite unequal.

69.

The diurnal period of the Moon, or a Lunar day, is the time it takes for the center of the Moon to return to the same meridian (by the daily motion of the Whole). This varies from day to day.

The length of time it takes for one of the planets to return to the same meridian is called a Day of Saturn, day of Jupiter, day of Mars, day of Venus or a day of Mercury.

In the space of a single day, there is very little difference between the extremely slow motion of the fixed stars and the daily period of the Equator.

70.

Just as you studied the periods of the Luminaries [the Sun and Moon], with regard to the ecliptic, we recommend you carefully measure the motions which are truly and naturally made by the other five planets (their eccentricity and their epicycles).

Try and distinguish (as best as you can) between their simple movements and their compound movements.

71.

In the same way we study the periodic conjunctions of the moon and the sun [eclipses], study how long it takes for a slower planet (through its true and proper motion) to return to another planet. (This must be done meticulously).

72.

The motion of the equator is the swiftest of all the celestial motions. Thus, of all the movements a planet makes, its daily period takes the least amount of time.

73.

Studious experimenters (lovers of sincere truth) have been able to discern and establish that celestial bodies are Imitated by inferior things in an orderly way, and in accordance with certain rules.

Every particular thing (or part of it) is affected primarily by one specific planet (or fixed star, or group of stars) which is called its Significator (to use the astrologer's term).

Any philosopher would agree that there are many ways that this Imitation manifests itself. It can be observed not only in Motion, Form and Figure, but in other properties and qualities as well.

#### Inference 1

The assiduous Magus should explore the great Harmony not only between the Significant and the Imitator, but also in Analogous things in the Microcosm [in Man]. Two things united in similarity will also be harmonious with a Third thing.

#### Inference 2

When any two of these have been identified, the third can be found. In the Anatomy of these Three—Celestial, Terrestrial and Microcosmic—a special quality found in one can be found in the other two.

For example, we suggest to you that by the Laws of Anatomical Magic you can see the connection between Sun, Gold, and the Heart of man.

74.

When the specific excellence of a Significator (a particular planet, fixed star, group of stars, or even a place in the sky) has been identified, it should be compared with the characteristics of other Significators (or other planets and fixed stars).

By skillful investigation, it can be understood how the performance of one Significator can either help or hinder the performance of another Significator.

75.

The spaces between the fixed stars have never changed in the whole eternity of time. Thus, there are things in the elementary world that have never changed.

However, all of the fixed stars are subject to an extremely slow Movement to the east, along the Ecliptic. [Precession of the Equinoxes]

As they are all driven by the same spirit, this means that likewise there are mutations and changes in our most important affairs (even though we consider them to be stable and consistent).

This slow revolution of the stars (by means of the Daily Motion of the Whole) makes a complete and unceasing celestial Harmony. This harmony which reverberates from all the fixed stars is kind of a First Form for everything.

All the fixed stars are harmoniously bound, not only to each other, but through their principal rays (and secondary rays), they are connected to each and every particle in the elemental realm. This is the way the Most beneficent and Wise Maker has ordained things to be. If this were not so, No Individual particle would (naturally) be preserved. Not even for a single day.

76.

This slow Motion of the Fixed stars means that over a long period of time, the same star will undergo growth, and even change. Thus, the effect of two stars or a small constellation of stars might (through their special power and their perceivable rays) also change.

77.

Sometimes a weak Agent will produce a stronger effect on a Subject than a stronger Agent. This may be caused by some natural tendency in the Subject or by some artificial rearrangement of the subject (or for some other reason).

This is best understood by those who have Paid their Respects to the Threshold of the Holy Art.

For that which has solemnly been Seven times Separated is ready to be Seven times Joined, to complete that most celebrated Gamaeam [marriage] of the philosophers.

I dare to assert (with God's approval)

that this is the Seven Times of David, שְׁבַעֲתַיִם ,  
which has been expressed for us in the Dual Number.

יב.

[What I have translated as "Seven Times," Dee has written in these Hebrew letters:

Shin, Bet, Ayin, Tav, Yod, Samech, which is essentially ShBATYS,

Dee's "Sabbatizat" in the

"Thus the World was Created" chart in the *Monas*.]

[In the margin, Dee has written the number 12 in Hebrew.]

78.

It is not surprising that certain stars which appear to be of the smallest size produce definite, perceivable effects in the air and other things. Even though they are very far away, these small stars are actually 18 times larger than the earth.

There are several reasons for this. It may be because they find an especially appropriate arrangement in the matter upon which they act. It may be because their rays are strengthened by another planet which bends the rays towards earth, invigorating them and making them more robust.

A star's energy might be amplified by something in its *periexontos* [surroundings] which causes the star to repeat its force every so often over a short period of time [creating an "echo" effect].

Moreover, what should we think about these fixed stars which are 30 times, or 70 times or 80 times larger than the whole terrestrial globe? And what (I ask you) should we think about the effect of those whose magnitudes are 107 times the size of the earth?

What are we to think of the divine power the earth receives at any given time from all the fixed stars of all sizes, distributed through the heavens in their most divine harmony?

[Dee is somewhat following the chart of magnitudes as determined by the Arab astronomer Al-fraganus (around 850 AD). (magnitude 6 is 18 times earth), (magnitude 5 is 36 times earth), (magnitude 4 is 54 times earth), (magnitude 3 is 72 times earth), (magnitude 2, 90, (magnitude 1 is 107 times earth). Most of his numbers are from the 6 part division of 108.]

#### 79.

If one equatorial period is subtracted from the time of a natural Day, and the remaining time is resolved into portions of the equator, it will be easily apparent how far the equator truly and naturally moves to the west using what are called Right Ascensions.

This is a true and specific demonstration of that most useful and admirable Astrological Praxis commonly called DIURNAL DIRECTION.

[This difference (or Daily Direction) is about 1 degree per day. This accounts for why the sun moves through all the signs of the zodiac over the course of a year (almost 360 degrees). Right Ascension is the celestial equivalent of terrestrial longitude. Praxis means an "accepted practice or custom."]

#### 80.

While observing this Diurnal Direction (the directional progress of the Equator on any given day when compared to the right ascensions of the Sun's position), also observe any other place in the entire celestial Machine.

Note carefully how much directional movement has been made above the meridian circle (or above the horizontal circle suited to that celestial point in the interval of time used to measure the forward movement of the Sun.)

Now we have established the right ascension and the oblique ascension of the Directional motion. [oblique ascension is the declination from the horizontal or the celestial equivalent of latitude.]

#### 81.

Subtract the Equatorial period from a Lunar Day and it will become apparent how much all celestial places are (as we might say) pushed forward Directionally with respect to their right ascensions and oblique ascensions.

[Dee is saying that the Diurnal Direction of the Moon can be determined the same way the Diurnal Direction of the Sun is measured.]

82.

The Diurnal Horizontal Period of a planet or fixed star is the time it takes for their centers to return to the same horizontal circle (by the Diurnal Motion of the Whole). [This is the time period between one rising (of a planet or star) and the next rising (of that same planet or star.)]

83.

Subtract one period of the equator from the Horizontal period of the Sun or the Moon, and what remains is the portion of the equator which has advanced Directionally to the west (beyond one full revolution).

[This is a reiteration of Aphorism 79, only applying it to the Moon's period.]

84.

Even though the strengths of the Sun and the Moon are clear and relatively uncomplicated in this system of Directional movements, the five Remaining planets (as Significators) and the fixed stars should be observed using a similar method (by watching their daily returns to their meridian circles and the horizontal circles).

Remember, we are only considering the true movements of the stars. Beware of prescribing a certain quantity (of degrees and minutes) to the individual Diurnal Directions of the planets, or their annual ones. (I will treat this elsewhere.)

[Dee recommends using observational calculations rather than using traditionally accepted estimates.]

85.

When their motions are retrograde, the daily period of any of the five planets is less than an equatorial period. Thus, it is essential that both the equator (and other individual movable places in the heavens) be pushed back to the east by these periods.

The Ancients called this surpassing of the equatorial period Reverse Direction. I need not remind you that this surpassing refers to the Horizontal circles as well as the Meridian circles. Nor that the equatorial period must be subtracted from any daily period [of a planet] moving retrograde. These things should be clear enough by themselves.

86.

When the daily period of Jupiter is compared to the equatorial period, a true and physical demonstration of a certain Direction results. The Ancients called this the ANNUAL PROGRESSION, in which they say celestial positions are moved towards the west by about a Dodecatemorium [one twelfth of a circle].

Nature urges you to observe either the parts of the Progression (compared to the true diurnal motion of Jupiter) or the whole annual Progression (compared to the true movement of Jupiter in one solar year).

If you do so, you will easily see that neither of these are always made in a straight line, nor is the number of degrees in the annual Progression the same from year to year (because of Jupiter's true annual movement with respect to the meridian circles and horizontal circles).

The movements of a planet (or a fixed star) cannot be determined by making only 5 readings, or even from 15 readings. Many, many readings must be made.



87.

Carefully examine how the DIRECT movement of a Planet causes it to Delay above the Horizon.

Discern why it makes this movement to include the Harmonic period of the equator in its own daily period.

Finally, learn why is it more likely to produce its particular effect on the Longitude of the Ecliptic.

Thus, it is not unreasonable to judge PLANETS progressing on a DIRECT course to be stronger and more endowed with good fortune.

Certainly those that move more SWIFTLY have greater strength and their significations are projected more fruitfully.

You can deduce from these Theorems what happens when a planet is both moving swiftly and is quite close to earth.

88.

A RETROGRADE Planet seems to somewhat break the constant rule of Nature by completing its daily period in a shorter time than the Equatorial period (which is our normal Time period, as it is the fastest and is always the same).

Second, by the general rule of Nature, the daily motion of all Celestial bodies ought to follow the Primum Mobile. But a Retrograde planet seems to snatch away some part of its function from the Primum Mobile by its own effort (as if taking control of the reins).

Third, it takes away a small part of that universal Harmony from each of its Daily Periods. After several days have passed, it will appear to have pushed back a sizeable portion of the Whole to the east. As it should be rotating perpetually to the west, this does a serious Injustice to the Equator.

Fifth, this obstinate planet seems to abandon its proper and special function, as the proper period for every planet should be completed toward the east.

Six, because of its delay above our horizon, it will be judged to have refused an opportunity to use its strength in a powerful way.

Thus, God did not wish that the Sun or the Moon (the most excellent of all corporeal creatures and the most benevolent to the elemental world) to be involved in these retrograde movements.

Nor does he allow other things to use such a tergiversation except for a very brief time (in comparison to their whole periods).

[Tergiversation means a turning back (from *tergum* "back" + *vetere* "to turn"). Cicero loved this word and used it frequently. Though it's not used much today, it is still in English dictionaries.]

But truthfully, the performance of retrograde planets does no harm to UNIVERSAL NATURE. They do not corrupt the status of UNIVERSAL NATURE any more than an infinite number of other Antipathies. Indeed, they make Nature more pleasantly ornamented and contribute greatly to the preservation of Nature's wholeness.

During RETROGRADE MOVEMENT a particular effect which a planet performs is not promoted, but rather reversed. They seem to become the Undoer of Deeds. The planet seems to become an Undoer of the Deeds it normally does.

But who doesn't perceive that such things are sometimes necessary and often extremely useful in both Political and economic affairs. Isn't it better (as they say) to move backwards rather than advance poorly.



By interrupting the significant effect and becoming a contrary significant for a while, a retrograde planet is often quite helpful, even though it is by incidental assistance and not direct assistance.

89.

In matters of which they are Significators, planets near their Apogee [farthest distance from earth] exercise their powers more forcefully and more magnificently than they do when they are near Perigee [closest distance to earth].

However, in other matters they act with more vigor and effectiveness when they are nearest to Earth (rather than farthest from Earth).

This Aphorism is demonstrated most brightly and vigorously in Aphorisms 41, 43, 73, 77, and others explained previously.

[These particular aphorisms that discuss the size relationships between two spheres, the cone of rays; Anatomical Magic of Sun, Gold and Man's Heart; and the Gameaem or David's "Seven Times."]

Thus in order to make insightful and precise judgements about things signified by the various planets, their Apogees and Perigees must be known.

However, using the artfulness of Catoptrics you can easily make any of the five planets very distant from EARTH (even over the span of a few days). And finally (in the blink of an eye) you can lead it back to a new Perigee.

I recall reading that once men tried doing this with the Sun and the Moon, but seeing that ephruason ethnê... [the heathen became unruly...]

[Shumaker notes that this Greek phrase comes from Acts 4:25, which derives from Psalm 2:1 in the Greek Septuagint text of the Old Testament. Messing with the rays Sun and the Moon using mirrors might make the masses suspicious and fearful. (Shumaker and Heilbron, p. 234)]

90.

The power of the sun is not always the same [due to its eccentricity with the earth]. The calculation of its effect is not always the same. The effects and forces of the various planets differ. Thus the COMBUSTION of various planets is not always the same.

[In Astrology, a planet is said to be "combust" (or burnt up or destroyed) when it gets to within about 10 degrees from the body of the Sun.]

Even though the Sun has the most eminent and most powerful virtue, it does not always cause harm when it COMBUSTS (as the Astronomers say) another planet.

Indeed, by transferring some of its own strength, the Sun can even amplify the nature of a Combust planet to an even greater magnificence.

But when the Sun does damage the effect of a Combust planet, the degree of harm will vary.

The degree to which Combustion affects the operation of the perceivable rays of a planet can be determined using the rules of Graduation which we treated above in Aphorism 19.

[Dee explains the Art of Graduation more fully in his 1570 *Preface to Euclid*.]

91.

There is no spot on the terrestrial globe upon which the Sun, Saturn, Jupiter, Mars or any fixed planet does not shine with its direct and perceivable rays (during each of their daily periods).

The fact that the whole earth can be illuminated and warmed by all these direct and perceivable rays (and in such a short period of time) demonstrates that the earth is Truly privileged to be such a Excellent location.

92.

When two stars that are in locations which are ANTISCIIS, their declinations are the same, and distances around their true horizon are the same.

[In Greek, *antiskios* means “counter-shadows;” the shadows of two people on opposite sides of the earth will be cast in opposite directions.]

Because of the Daily Movement of the Whole, these stars make a mutual turning and will continue to surround and embrace some Terrestrial body. It’s as if the care of that body had been entrusted to them.

Two stars working together in this fashion (whether relating in schematic or an aschematic interval) produce a certain effect. This effect can be found in the constitution of a known [Terrestrial] body which is exposed to them.

[Shumaker suggests that “schematic or aschematic” might mean “exact or approximate.”]

93.

The part of any Celestial Circle parallel to the equator, which under the Meridian of some location (from all parts of that parallel), makes the greatest angle of incidence with the true horizon of that location.

However, only that part of the Ecliptic which is in the Nineteenth Degree from the horizon will always be elevated in the highest degree above the horizon.

[The Sun is exalted in the nineteenth degree of Aries.]

I realize that it is well known to anyone moderately versed in Astronomy that this nineteenth part is rarely found under the Meridian in an Oblique Sphere, but usually in a Right Sphere.

Thus, (in places whose Vertices are somewhere other than on the equator or on the poles of the World), that part of the Ecliptic found beneath the Meridian (at any given moment) has been called the Heart of the Sky. (The nineteenth part from the place of the ascendant is referred to as the Tenth House.)

94.

All stars are sharers of Light. So, (aside from the specific powers of their imperceivable rays), they are the efficient causes of a certain heat.

95.

The Sun, (the largest of all celestial bodies) is not only the perpetual, immense source of celestial Light for us, but also the main producer of perceivable heat, which is so vital to our existence.

96.

The greatest Heat of the sun will be at the point over which the Sun hangs perpendicularly at the time of its Perigee [closest to earth].

The Heat from the entire Base of the Sun’s radiant Cone affects that natural point on the earth’s Surface which is at the vertex of that radiant cone.

We generally assume (for the sake of illustrating our Doctrine) that it has a power of Sixty degrees, or One Hundred degrees.

[Dee appears to be saying the Sun is so hot it would be way off the scale of his Art of Graduation which only goes to four “degrees” of heat.]

97.

Besides determining this maximal degree heat at Perigee, we should learn how much heat the SUN directs to various points on the earth's globe (over which it hangs perpendicularly) during the rest of its annual Circuit.

98.

When the sun hangs perpendicular above you, note the amount of heat it makes in some suitable material.

Then you will understand (by experience, not proportional calculation) how much heat it will direct to any other terrestrial point over which it hangs.

99.

Suppose you had two different degrees of heat (in a particular proportion) in two different terrestrial locations that are perpendicularly beneath the two different places of the Sun's Circuit.

Also suppose (at any time when the Sun is shining for us) we devised some kind of artifice that could produce a perceivable heat equal to the heat found in one of those places.

It would be possible, through our Artifice and industry, (at any given moment, provided the Sun is Shining) to produce perceivable heat that would be exactly equal to the other location on earth.

However, this is not the place to explain at how great a distance.

[Dee emphasizes that the Sun must be shining. So he may be referring to some Catoptric heat-multiplying device, perhaps involving concave mirrors.]

100.

Using these same Rules, most accurately examine how much less heat producing power the Planets have compared to the Sun, (as a result of the size of their Conical bases with respect to some terrestrial point, above which the planet hangs perpendicularly, when the planet is at its smallest distance from earth.)

You can calculate the amount of Heat a planet produces by comparing its base and distance with the base and distance of the Sun.

But always keep THIS in mind: Each and every planet (because of its own particular body) mixes another perceivable quality with the general power of its heat. And what sort that is (not only in the planets but also in the fixed stars) you can learn by studying the Moon (refer to the test described in Aphorism 53) and also by other ways.

[In Theorem 53 he recommends using a mirror to somehow calculate the power of the light generated by the Moon itself during a Solar eclipse. Dee's apparently believes that planets generate heat and light. But this is not actually the case. Also as the planets and stars are so vastly far away, his geometry of finding conical distances is a bit unusual. That the "other perceivable quality" Dee refers to here might be moisture (or humidity), the other axis of Dee's Art of Graduation.]

101.

We can apply the rules we used for the Sun to determine the various amount of the Moon's heat (over any particular terrestrial point over which it hangs perpendicularly).

But obviously we must take into consideration the moon's distance from earth at any given time and also how much of the Moon's convex surface facing earth is illuminated (that is, what proportion of the conical base is illuminated).

Let the Careful and diligent Astrologer consider why Lunar rays don't assist each other very well much the Moon is Horned, compared to when it is nearly full. In all these Aphorisms I leave many things to judgement.

102.

The most special properties of celestial bodies are LIGHT and MOVEMENT. Among the planets, the SUN surpasses all others in LIGHT. The MOON supercedes all the planets in the swiftness of its MOVEMENT. Thus, these two are rightly considered to be the most excellent of all the planets.

103.

The MOON is the most powerful directress of moisture. She is both the producer and cause of humidity.

104.

The SUN, with its excellent LIGHT, is the special director of vital heat. And, by a certain wonderful analogy, the MOON, with its swift MOVEMENT, is the special directress of moisture.

105.

The closer the MOON is to the earth, the swifter it moves, and the more it exercises its own powerful dominion over humid things.

106.

From these things it becomes apparent that the SUN and MOON are (after God) the truly special physical causes of the procreation and preservation of all things born and that live in the elemental world.

Through Heat and Humidity “all things are measured and increased” (if I may use the words of our philosopher). For only these two things are “procreative.”

[Dee writes “all things are measured and increased” in Greek (*panta sugkrinetai kai auxetai*) so he’s probably referring to Plato or Aristotle. For “procreative” he uses the Greek word *gonima*.]

107.

By a certain analogy, the general arrangement of a whole year can be seen in a single day.

- “ For any natural Day has its own Spring, then Summer, then Fall and then Winter.  
“ From the heat of only the Sun (partly through itself and partially by chance) all the  
“ primary qualities can be produced, and in the correct order.  
“ If we distinguish a beginning, a middle, and an end in each of these we will perceive  
“ the foundation of the Duodenary. [4 (seasons), times 3 (moments) of each, equals Twelveness]  
“ And it is glorious to consider how, under the poles of the World, a Year resembles  
nothing more than one single natural Day.

To you who investigate the physical mysteries in the unity of The Trinity and to you who gasp painfully, surrounded by your Work in the Blackness of the multicolored Night, apply this Aphorism to higher matters and the greatest Secret will be revealed.

108.

In the eighth book of his great composition [The Almagest], Ptolemy describes 26 different relationships that can exist between the fixed stars and the Sun (which itself has four angular positions).

Transfer these relations to the other planets (and especially to the Moon).

Compared this way, there will be a total of 182 different relationships between the planets and the fixed stars.

[7 planets, times 26 relationships with the fixed stars, makes 182 total relationships]



109.

An imperfection of the Body, not the Soul, is the nearest and most personal cause of physical Death. Thus, nature is the cause of natural death.

Death is dependent upon (and is marked out beforehand) by the general Governors of Nature. In the Human race, certainly, Nobody can live beyond the time Limit predetermined for him by God. However, through their own negligence, very few are even able to reach that Limit. Thus, it appears there are two different Limits for human life.

110.

The human Soul and the specific Form of each and every thing have far more excellent virtues (and provide more services) than either the Body or the Matter from which it is made.

111.

The **imperceivable** (or unintelligible) rays of the planets are to the **perceivable** rays as the **Soul** (of something) is to its **Body**.

112.

Some stars have been called EVIL, but stars themselves do nothing evil. They have simply poured their strengths either into things of a corrupt Nature or Matter which is badly disposed in the first place. (Refer back to Aphorism Seven.)

[Aphorism 7 reads: Rays pouring from one thing affect various things in different ways.]

113.

There are two reasons for the natural diversity found in all the things that exist in the elemental world. First, there are various kinds of Matter. Second, different stellar rays affect Matter in different ways.

114.

Everything that exists in the elemental world, no matter how miniscule, is an Effect, or a particular Example, or an Image of the whole of celestial Harmony. Its just more clearlt apparent in some things more than others.

115.

Thus there is an ANALOGY between celestial bodies (either alone or working together) and bodies in the realm of the Elements.

If you are carefully and constantly looking for these similarities (by using the art which has been described above), you will follow the wide pathway towards complete understanding of Astrology.

116.

The Seven planets are able to exhibit 120 different Conjunctions:  
There are 21 possible conjunctions between any 2 of the 7 planets.  
There are 35 possible conjunctions between any 3 of the 7 planets.  
There are 35 possible conjunctions between any 4 of the 7 planets.  
There are 21 possible conjunctions between any 5 of the 7 planets.  
There are 7 possible conjunctions between any 6 of the 7 planets.  
There is 1 possible conjunction between all 7 of the 7 planets.

The total is 120 possible conjunctions.

The greatest philosopher tells us, most truthfully:

**“In these lies the knowledge of things created in the world:  
of their origin and of their destruction.”**

To further investigate these 120 different Conjunctions, we recommend the following Procedure.  
For conjunctions of 2 of the 7 planets:

There are 21 possible conjunctions when 2 of the seven planets are joined

Next consider that one of these 2 planets involved is stronger than the other.

Now there are 42 possible conjunctions.

[21 or  $1 \times 2 = 2$ ; and  $2 \times 21 = 42$ ]

In the same way, when 3 planets are joined there are 210 possible conjunctions.

[3! or  $1 \times 2 \times 3 = 6$ ;  $6 \times 35 = 210$ ]

When 4 planets are joined there are 840 possible conjunctions.

[4! or  $1 \times 2 \times 3 \times 4 = 24$ ;  $24 \times 35 = 840$ ]

When 5 planets are joined there are 2520 possible conjunctions.

[5! Or  $1 \times 2 \times 3 \times 4 \times 5 = 120$ ;  $120 \times 21 = 2520$ ]

With 6 planets there are 5040 possible conjunctions.

[6! or  $1 \times 2 \times 3 \times 4 \times 5 \times 6 = 720$ ;  $720 \times 7 = 5040$ ]

With 7 planets, there are also 5040 possible conjunctions.

[7! or  $1 \times 2 \times 3 \times 4 \times 5 \times 6 \times 7 = 5040$ ;  $5040 \times 1 = 5040$ ]

The sum total of all these different kinds of Conjunctions is 13,692.

Remember, all these possible Conjunctions are based upon the  
premise that the strengths of the planets are **unequal**.

(If we took into consideration that there were different degrees of inequality,  
almost innumerable myriads of different permutations could be found.)

conjunctions involving planets of <b>unequal</b> strengths (as per Aphorism 116)				conjunctions involving planets of <b>equal</b> strength (as per Aphorism 117)		
1	1	0	0	0	7	5040
2	2	21	42	2	6	15120
3	6	35	210	3	5	4200
4	24	35	840	4	4	840
5	120	21	2520	5	3	120
6	720	7	5040	6	2	14
7	5040	1	5040	7	0	1
			13692			25335
number of planets involved in the conjunction	how many permu- tations are possible	number of types of conjunctions of 2, or 3, or 4, or 5, or 6, or 7 conjunctions	column 2 times column 3	number of planets involved in the conjunction	inequality produced from equality (generally 8 minus column 5)	column 6 factorialized, then times column 3 (except first entry)

Using the same procedures, let's look even more deeply into the virtues of Nature. We assert with most certainty that the rays of the seven planets (the principal perceivable rays, subsidiary incidental rays, and rays of a more secret influence) converge and mingle with each and every thing in the world, at all times.

And this perpetual conjunction of all these planets remains in each and every thing in the World (not only because of the natural effects of the planets, but also because of their actual positions in the heavens).

Thus, if the powers of the planets were unequal, Nature is able to control their workings in 5040 different ways. [1x2x3x4x5x6x7=5040]

Next, consider that sometimes 2 of the planets have equal degrees of power (or sometimes 3, sometimes 4, sometimes 5, sometimes 6, or sometimes, but very rarely all 7)

We would find there are 20,295 possible relationships. (These equalities might be found in the highest degree, the lowest degree, or even in some intermediate degree). If we add to that the 5040 kinds of absolute inequality, the result would be 25,335 possible relationships (indeed, very general ones).

It is most worthwhile for the philosopher to apply the rules of Graduation to these results for it will lead to great pleasure and immeasurable usefulness.

So you can more easily understand the truth and arithmetical Logic of these two Aphorisms [116 and 117], we have included a chart of our calculations (which is also very useful for other purposes).

The industrious artificer will be able to extend this Procedure almost infinitely, not simply stopping with the number Seven.

The computations in the second part of that chart are difficult to see.

So to help students, we offer this example (and explanation):

If only 2 planets (out of the 7) have equal strength, six general distinctions will be found among all the strengths. (This can be seen in the fifth and sixth columns).

But according to the third column,  
a binary conjunction among the 7 planets can happen in 21 different ways.

And in the second column,  
the unequal strengths of 6 planets are able to be considered in 720 different ways.

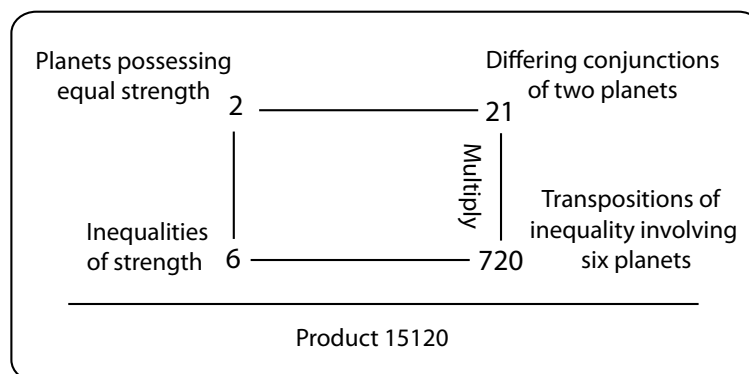
Multiply 720 times 21 and you get 15120,

(the number you will find in the second place down in the last column).

Apply this same method of computation

when 3, 4, 5, or 6 are furnished with equal strength.

Finally, to more fully explain this matter, here is a very brief chart of the work.



118.

Within the Revolution of a Solar year, look for the beginning or some other noteworthy moment in the period of a planet.

Or, at any time, look for some strong and unusual configuration of planets (or of the planets and special fixed stars). Or any other unusual Astronomical event.

Then Look Around the whole world astronomically and determine what terrestrial place is (or might be) affected by the first Appearance of such a powerful and special configuration in the heavens.

There are two ways this remarkable and secret procedure works.

You can understand how the nature of the stars and other Sublime celestial things will influence the events at a particular Place on earth. Or by studying the outstanding events of a particular Place on earth, you can better understand the special nature of the planets, fixed stars, and other Sublime celestial bodies.

Thus a Wise Man (if he is a Cosmopolite) [a Citizen of the World] can draw upon this most noble Science (for himself or for others) to procure favorable things or, contrarily, to remove noxious things. Thus, the Opportunity [favorability] of various terrestrial places is of great importance.

This is all similar to the tale from long ago of the Wise Men who,  
having looked around the heavens,  
declared:

“WE HAVE SEEN HIS STAR IN THE EAST.”

119.

As Thrice-Great Hermes has taught us:

*Xoris tês kosmikês sumpateias, tois anthropois ouden epiginetai.*

Nothing happens to men without cosmic sympathy.

120.

*Ikana ta THEIA, kai ê touton Periphora, tèn en to kosmo  
ton phusikos ginomenon, Sunexeian phulassein.*

Certain befitting divine things and their circular motions are enough  
to preserve the continuance of everything that is physically born in the cosmos.

HONOR AND GLORY TO GOD ALONE









# INCLYTI REGIS MAXIMILIANI EXCELLENTISSIMAE MAIESTATI,

IOANNES DEE, LONDINENSIS,  
Imperium optat Felicissimum.

**V**æ duæ causæ, meæ Conditionis Hominem, REGEM tantum, tam exiguo donare Munere, animare possunt, hæc ambe, nunc, me ad hoc faciendum impulere. Benevolentia nimirum erga vestram Maiestatem mea maxima: Et Muneris ipsius, licet parui, tum Raritas magna, tum Bonitas haud aspernanda. Benevolentiam vobis excitare et conciliare sempiternam vestra admiranda Virtutes: Quæ tanta sunt, Ut, qui illas oculata non perspexerint fide, alijs quidè, vel mediocriter credant, Rarissima, de eisdem; licet verissima, narrantibus. Sed qui easdem diligenter accuratiusq; sunt Contemplati Præsentes: Orationis, scilicet, Dilectionisq; maxima laboraturos Inopia ac paupertate fatibuntur, quam primum Oratorie in earundem omnem se diffundere cupiant Amplitudinem. Huius rei causas, Ego, proxime iam præterito Septembri, in Hungarici vestri Regni Pofonio, aliquam trabens moram, luculentissimas, easque varijs exploratas modis, oculatus cognovi Testis.

De Muneris autem (mole quidem ipsa exigui) quod dicerem Raritate; verbis, quam fieri possit, paucissimis; Adibi, Mentis indaganti conamine toto, Occurrit Humana

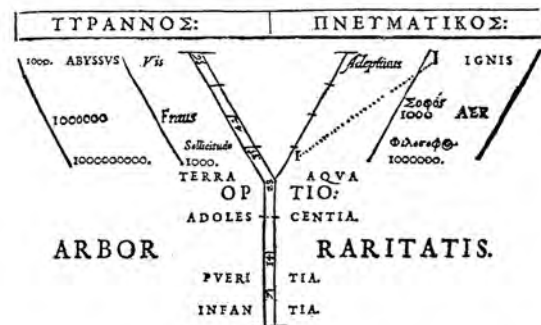
A 2 ne vita

## PRAEFATIO AD REGEM

na vitæ Duplex, inque duæ sententias, Cursus (quorum alterum ingrediuntur Plerique omnes) istac considerandus ratione. Quam primum, Infantia confectio curriculo, Pueritiaeque: Adolescentum iam, Quod vitæ deinceps ingredientur genus, Animum torquere incipiat Optio: Tunc, in ancipitis iudicii aliquantulum hesitantes, Bivio: Statuunt tandem: Vel, (Veritatis filij quidem & virtutis Capti Amore) ad Philosophandum, toto reliquo vitæ spatio, nervos contendendos omnes: Vel, (Illi certe, Mundanis irretiti Illecebris: aut Divitiarum flagrantes Cupiditate) delicatæ Quæstuosissimæ vitam ducere, modis sollicitè laborandum omnibus. Et Istorum, Mille, profectò, i. vel facillimè inuenias: Vbi florum (sincerius scilicet qui Philosophiæ operam navant) vix Vnum monstrare queas: Qui ipsa Physicæ, saltem prima Veraque, degustarit fundamenta. At, Qui Cælestium virium & Actionum: Rerum aliarum Ortus, Status, Obitusque, fuerit penitus pleniusq; perscrutatus Causas: ne eorum quidem, qui se totos ad Sapientie studia convertere, Mille sumum, in medium adferre, Resp. Literaria potest. Quid ergo, Qui istis difficultatibus superatis omnibus, ad Supercælestium Virtutum, Metaphysicarumque Influentialium Speculationem & Comprehensionem Aspiravit, Vbi hunc, in toto Terrarum Orbe (nostris istis deploratissimis Temporibus) Magnanimum, vel VNUM, esse sperabimus HEROA? Cum iuxta prioris nostræ (haud temerè receptæ) MILLESIMÆ Proportionis Progressum: Ex CENTVM SINCERE PHILO-

## MAXIMILIANVM.

PHILOSOPHANTIVM MYRIADIBVS: AT EX PROMISCVÆ HOMINVM SORTIS, CENTVM MYRIADVM MILLIBVS, HVNC VNICVM FOELICISSIMVM FOETVM EXPECTARE DEBEMVS. Cuius sic demonstratæ RARITATIS, HIEROGLYPHICVM Typum, ad Pythagoricam (dictam) appingemus literam. Vbi, vestra Excellentia attentius intuenti, maiora sese (consideranda) offerre videbuntur, MYSTERIA: ex nostris hoc modo descripta COSMOPOLITICIS Theorijs.



In quo nunc Triplicis istius (Philosophicæ) explicate Raritatis Gradu (Clementissime REX) Optarem quidem hoc meum Esse, Censeri que Munus: Vel Ipse, qui Artium Maximarum, Rerumq; Secretissimarum cognitione Excellit & Abundat

A 3



Abundantia, facili possis assequi coniectura. At in Infimo, 1. primoque Philosophandi genere, statuere: non id à me arroganter esse factum existimo. Etsi ab humo, alius interdam videatur Caput leuare velle: Ex eodem ergo & BONITATIS Gradu, fructus vberes, de isto meo Sperandos Munere, Vestra Celsitudini polliceri, audeo. Et, hac 2. quoque Raritate prae ditum est, hoc nostrum Munus, Quod eo genere Scribendi, usque ad extremum Orationis filum, contextum est, quo, nunquam, ad hodiernum usque diem, aliquod fuisse absolutum Opus, vel auditione accipere potui, vel ex Maiorum intelligere Monumentis.

Hieroglyphicum etiam licet appellem, subesse tamen & 3. Lumen & Robur quasi Mathematicum, Qui penitus examinari, fatebitur: Quod in tam Raris faciliare rebus, satis esse Rarum liquet. An non hoc Rarum, quae 4. Astronomicos Vulgares Planetarum Characteres, (ex Mortuis, aut Mutis, aut saltem quasi Barbaris ad hanc horam Notis,) Nam, Vitae in Immortalis: & in omni Lingua & Natione, proprias suas Eloquentissime explicare posse vires? (qui etiam accedit & istud valde Rarum: Externa eorumque Corpora, ad mysticas iam suas (optimis Argumentis Hieroglyphicis) esse reuocata, restitutaue Symmetrias. Quasi, vel eadem fuisse olim, apud Saeculum prius: vel tales fore nostri Optassent Maiores. In Ecliptica 6. Dodecatemoriorum Notis, quam nouo, feliciter, idem praestare tentauerimus successu, & id videre, Ut est Rarum, ita Nouum prorsus. Et haec quonia in Vnico, eoque MER- 7.

CVRII,

CVRII, Characteres Hieroglyphici (Acumine quodam praeunito) includi, est omnino Rarissimum. Verè ergo, Ille, nobis totius Astronomiae Refractor & Instaurator nominari potest: Et nostri IEOVÆ in hoc genere Nuncius, ut Sacram hanc Descriptionis Artem, vel NOVAM Conderemus Primi: vel extinctam prorsus, & ex omni hominum Memoria deletam, eius Reuocaremus Monitis. Idque, à nobis, hoc est factum modo, ut placidissime, & quasi sua sponte, Hieroglyphica illa Interpretationes Omnes, sese in medio ponant: Violentum nil, vel Improprrium quasi per totum videri Opusculum potest.

8. Et haec, Ita, LONDINENSI nostro HERMETIS SIGILLO (ad sempiternam Hominum memoriam) Consignari, Ut, in eodem, ne Superfluum Punctum Unum; & ad haec quae diximus significanda, (longeque maiora) ne unum deficiat Punctum, Omnes cogentur, maxime fateri Rarum. At praeter ceteris, Illi, qui in Philosophia Sapientiaeque profundioribus Disquisitionibus, Nomen possunt profiteri suum. Sic enim Testificabuntur 1. Grammatici: dum rationes esse reddendas, de Literarum formis, Situ, Locis in Ordine Alphabetario, Nexibus varijs, Valore Numerali, alijsque plurimis (quae circa Trium Linguarum Alphabeti Primaria considerari debent) hic admoneri se videbunt. Ut & alias, tam Rarum esse Grammaticum, QVI Grammatica, VNAM esse Scientiam, ab VNO discendum Homine, exacte defendere possit: Quam filum; quem Supra in Terris demonstrauimus Rarissimum:

Num: Apologeticè, olim differuimus. Sed tanta de his militum: In Speculo constant Mysteria, quae solidissima habent (tum istius Artis Grammaticae: tum eorum quae eiusdem eruantur auxilia Mysteriorum) in Sacrosanctis DEI OMNIPOTENTIS Scripturis, iacta Fundamenta, quanta nec Libro explicare magno queam; nec Locus iste, iam, requirere videtur. Neque mireris, O Romanorum Rex Inclite; Me, Alphabetariam Literaturam, magna continere Mysteria, nunc obiter referre: Cum IPSE, qui omnium Mysteriorum Author est SOLVS, ad Primam & Vltimam, SEIPSVM Comparauit Literam. (Quod non in Graeca solum esse intelligendum Lingua: sed tum in Hebraea, tum in Latina, varijs, ex Arte ista, demonstrari potest vijs.) O, Quanta, tum, debeant esse, Intermediarum Mysteria? Et non est mirum, hoc, in literis sic constare: Cum & Visibilia & INVISIBILIA omnia: Manifesta, & Occultissima (Natura vel Arte) ab ipso Deo emanantia, ad eius BONITATEM, SAPIENTIAM & POTENTIAM, praedicandam, celebrandamque, à nobis, diligentissima Indagine sunt perlustranda. Inde, excusatione omni carere, HV-

MANVM GENVS, docebat Paulus: Etiam si, nullum aliud de his haberet Scriptum Monumentum; Quam, quod ex CREATIONE, ipso Digito DEI, in omnibus est exaratum Creaturis. At, hoc nunc non ago, Curiosius, ut ista ab omnibus requirere velim Grammaticis: Sed Ipsos, Qui Rerum abdita eruere Mysteria Laborant: cum, Testes facere, nos, RARVM quoddam in hoc Genere, (ex nostra

MONA-

MONADE;) demonstrasse Exemplum: tum, Amicè admonere; Primas, Mysticasque, Hebraeorum, Graecorum, & Latinorum literas: à Deo solo profectas, & Mortalibus Traditas: (Quicquid humana iactare solet Arrogantia) Earumque omnium Figuras, ex Punctis, Rectis Lineis & Circulorum peripherijs, (mirabili, Sapientissimoque dispositis Artificio) produisse. Et, licet, omnem Mosaicæ Legis sensum, usque ad Iodum & Apicum Impletionem omnium, considerandum esse, nos docuit aeterna Caestis Math. cap. nostri Patris Sapientia: quasi in IOD & Chireck (ex quibus omnes Hebraeorum Literae, Vocalesque consurgunt) vltima Considerationis Legalis, facta Analyti: Nobis tamen non est id Contrarium, VNITATE APICIS CHIRECK, IMMOTA MANENTE: TRINITATEM MONADVM CONSUBSTANTIALIVM, IN VNITATE IPSIVS IOD, CONSPICVAM, Amplectentibus: Ex RECTA DESCENDENTE LINEA VNA, ET DIVERSIS PERIPHERIÆ PARTIBVS DVABVS, CONFORMATAM. Unde satis enucleatè, eodem labore detegimus: Primos Homines, tam Stupendam Hebraicarum Literarum & Nekudoth Fabricam, ex tam Mysticis condere Principijs, sine Praesentissimo Diuini Numinis Afflatu, non Potuisse. Quae, etiam si, Minima eorum sunt, quae vulgari Grammaticorum ponderentur Iudicijs: Dum tamen, quo sese ad omnem Literarum & Nekudoth Generationem, & quam mirabili accommodent Artificio, aptè à Sapientibus confi-

B

derantur,



fiderantur, Maxima, perpluraque (absolutissima *Analoga*) illos edocent *Mysteria*. Sed dimissis, hoc modo, *Litterarum* istis, & *Linguae Philosophis*, *MATHEMATICOS* meos, *Raritatis* istius nostri *Muneris*, ad-  
 2. ducam sincerissimos *Testes*. *ARITHMETICVS*, (non dico, *LOGISTA*) an non mirabitur, *Numeros* suos, quos à rebus *Corporatis Abstractos*, & *sensibilibus omnibus* liberos, in *Dianæ* recondit recessibus, ibique, *Mentis* varijs tractabat *Actionibus*: Eosdem, hic, in nostro *Opere*, tanquam *concretos* & *corporeos* ostendi, fierique: & eorundem *Animas*, *Formalesque vitas*, ab eis, in nostros se-  
 3. cerni vsus? An non maximè mirabitur, *Tantum videre* *MONADIS* *Fatum*: cui nec vlla *Monas* *Alia*, vel *Numerus*, *additione* accedit: Nec extrinsecè ad ipsam *Multiplicandam* *adhiberi* potest? An non admiratione afficietur maxima, in *Rei* & *Census* *Subtilissima Generalique* *Regula*: *VNIUS REI*, tanquam *Chaos*, *proposita*, (ad omne dissoluendum *Arithmeticum Dubium*, *habilis*) *CENSVM* ipsum, & *Valorem*, siue *Æstimationem* (*Potentia* in ipsa *RE* *Latentis*) *Hic*, *Primo* semper *Examine*, *DE* *NARIO* explicari *Numeros* *Accuratis* *Diuisionis* & *Æquationis* *operibus* (vel ut illa *Ars* *prescribit*) *mediatibus*  
 3. *prima*? *GEOMETRA* (mi *Rex*) sibi de *Artis* *sue* *vix* satis plenè cōstare *Principijs* (quod valde mirū est) incipiet *hesitare*: cum, hic, in *Secreto*, *murmurari*, *frunuique* *intelliget*: *QVADRATO*, *CIRCVLARE*, omnino *Æquale*, huius *MONADIS* *Hieroglyphica* *Mysterio* dari.

Archime-

*Archimedisque dictos* *SVDORES*, hic, *excellentissimo* cō-  
 pensari posse *Fructū*: licet tentatum haud fuerit ipse affe-  
 ctus *Problema*. In *Magnis* *Voluisse* *Sat* est. *MY-*  
*SICVS*, quo stupore *Ille* possit *iure* affici *meritissimo*: cum  
 1. sine *Motu* & *Sono*, *Inexplicabiles*, *Calestesque* hic *Intel-*  
 2. *liget* *HARMONIAS*? Et *ASTRONOMVS*, an non  
 3. *perpepsi* sub *Dio* *Algoris*, *vigiliarum* & *laborum* *pœnite-*  
 4. *bit* se maximè, Cum, hic, sine *Aëris* vlla *perferenda* *Iniuria*:  
 5. Sub *tecto*, *Clausis* *vndiq;* *fenestris* *Ostijsque*, ad quodcun-  
 6. que *datum* *Tempus*, *Calestium* *Corporum* *Periphoras*, *ocu-*  
 7. *lis* *exactissimè* *queat* *observare*? Et hoc quidem, sine *Me-*  
 8. *chanicis* *vllis*, ex *Ligno* vel *Orichalco* *confectis* *Instrumentis*? Et *PERSPECTIVVS*, sui *Ingenij* *Stupidita-*  
 9. *tem* *condemnat*: *Qui*, ut iuxta *Parabolica* *Coni* *Seccio-*  
 10. *nis* *Lineam* (aptè in *gyrum* *circumactam*) *Speculum* *efficeret*, *modis* *laborarit* *omnibus*: quò *propositam* *quancun-*  
 11. *que* (*igni* *obnoxiam*) *Materiam*, *incredibili* ex *Radys* *So-*  
 12. *laribus* *vexaret* *Calore*: Cum, hic, ex *Tetrahedri* *Secciónem*  
 13. *Trigonica*, *Linea* *exhibeatur*, ex cuius *Forma* *Circulata*,  
 14. *fieri* potest *Speculum*; *Quod*, (vel *Nubibus* *Soli* *subdu-*  
 15. *ctis*) quoscunque *Lapides*, vel *Metallū* quodcunque in *Im-*  
 16. *palpabiles* quasi, vi *Caloris* (*verissimè* *maxima*) *redigere*  
 17. potest *Pulveres*. Et, qui *PONDERVM* *subtili* *Spe-*  
 18. *culatōni* *toto* *vite* *Tempore* *insudarit*: *Quam* *bene*, *suos*  
 19. *ille* *collocatos* *esse* *Labores*, *sumptusque* *iudicabit*: Cū, hic,  
 20. *Elementum* *Terræ* *supra* *Aquam* *natare* *posse*, *certissimè*  
 21. *Experientia*, *MONADIS* *nostræ* *docebit* *Magisterium*?

B 2 Haud

8. Haud secus, *Qui* *Rationes* *PLENI* & *VACVI* (*argu-*  
 9. *mentum* usque ab ipsis *Philosophia* *Incunabulis* *contra-*  
 10. *uersum*) *diligentissimè* *ventilarunt*: *Videruntque*, ea *Le-*  
 11. *ge*, & *Naturæ* (quasi *Indisolubili*) *vinculo*, (à *Deo* *Opt.*  
 12. *Max.*) *coördinatas*, *cōnexas*, & *Copulatas* *Elementorum*  
 13. *proximorum* *esse* *Superficies*: *Ut* in *Ignem*, *Aëre* & *Aqua*,  
 14. *sursum* *deorsum*, *Horsum* *Illorsum*, (ex eorum *animi* *sen-*  
 15. *tentia*) *ducendis* *impellendisque*, *hominibus* *Miranda* *con-*  
 16. *fidētissimè* *ostendere* *possint* (*Varijs* & *illi* *quidem* *fu-*  
 17. *uentis* *Reip.* *sunt* *utiles*: *Ut* *Hydraulicorum* *totum* *Ar-*  
 18. *tificium* *monstrat*, & *reliqua* *Heronis* *Thaumopœtica*,  
 19. ut nunc placet *illa* *nominare*.) *At*, quod *Terræ* *Elemen-*  
 20. *tum*, *Sursum*, in *Ignem*, per *Aquam*, vlla *Machina* *ex-*  
 21. *antlare* possit: *Nullus* ex *illa* *Professione*, sibi *vindicabit*.  
 22. *Nostre* *tamen* *MONADIS* *Theoria*, fieri id posse, *demon-*  
 23. *strant*. *O* *Sapientissime* *Rex*, *Ista* in *Mentis* *vestræ*, *Me-*  
 24. *morieque* *reponatis* *Theauris* *Secretissimis*. *Ad* *CA-*  
 25. *BALISTAM* *iam* *venio* *Hebraum*: *Qui*, *visuā* (sic di-  
 26. *ctam*) *Gemetriam*, *Notariacōn*, & *Tzyrroph* (*Artis* *sue*  
 27. *tres* *quasi* *precipuas* *Claues*) *extra* *Sanctæ*, *Nuncupate*,  
 28. *Linguae* *exerceri* *fines* *videbit*: *Immo* *vndiquaque* (ex *ob-*  
 29. *uijs* *quibusque*, *visibilibus* & *Inuisibilibus*) *huius*, (à  
 30. *Deo*) *Recepta* *Traditionis* *Myfica* *Notas*, *Charactere*  
 31. *que* *corrogari*; *Vel*, *hanc* *quoque* *Artem*, *tum*; *vocabit*  
 32. *SANCTAM*: (*veritate* *coactus*, si *intelligat*) *Vel*, *non*  
 33. *Judeorum*, *tantum*; *Sed* *omnium* *Gentium*, *Nationum* &  
 34. *Linguarum*, siue *αποστολική*, *Eandem* *esse* *DEVM* *Be-*  
 35. *neuolentissi-*

*neuolentissimum* *fatebitur*: *Nullumque* *Mortalem* *se* *Ex-*  
 2. *cusare* *posse*, de *Sanctæ* *huius* *nostræ* *Linguae* *Imperitia*.  
 3. *Quam*, in *nostris* *ad* *Parisienses* *Aphorismis*, *REALEM*  
 4. *nominavi* *CABALAM*, siue *Tā* *εἰς* *τὸς*: *Ut* *illam* *vulgarem*  
 5. *alteram*, *Cabalisticam* *nomino* *GRAMMATICAM* siue  
 6. *Tā* *λεγομένη*, *quæ*, *notissimis* *Literis*, ab *Homine* *Scriptibili-*  
 7. *bus*, *insistit*. *Hæc* *autē*, *quæ* *creationis* *nobis* *est* *Nata* *Le-*  
 8. *ge*, (ut *Paulus* *innuit*) *REALIS* *CABALA*, *GRAM-*  
 9. *MATICA* *quoque* *quædam* *Diuinior* *est*: cum *Artium*  
 10. *istâ* *sit* *Inuentrix* *Novarum*, & *Abstrusissimarum* *fide-*  
 11. *lissima* *Explicatrix*: *Ut* *hoc* *nostro* *alijs* *tentare* *Exemplo*,  
 12. *de* *cetero*, *possint*. *Non* *exhorresces*, *beneficio*. (*O* *REX*)  
 13. *Licet* *iam*, in *vestra* *Regia* *Præsentia*, *MAGICAM* *hanc*  
 14. *proponere* *audeam* *Parabolam*. *Terrestre* *quoddam* *Cor-*  
 15. *pus*, *MONAS* *hæc* *nostræ* *Hieroglyphica*, in *Centro* *Centri*,  
 16. *Latens*, *possidet*: *Quod*, *Qua* *sit* *ACTVANDVM*  
 17. *diuina* *Potētia*, sine *Verbis*, *Ipsa* *docet*: *Cui* *iam* *ACTVA-*  
 18. *TO*, *Lunaris* & *Solaris* *est* (*Matrimonio* *perpetuo*)  
 19. *COPVLANDA*, *Influentia* *Gonetica*: *Licet*, *ante*, in *Cæ-*  
 20. *lo* *vel* *alibi*, *fuere* *ab* *EODEM* *Corpore* *SEPARATIS-*  
 21. *SIMÆ*. *Hæc* (*Dei* *Nutu*) *facta* *Gamaa*, (*Quam*, *Parisi-*  
 22. *ensibus*, *sum* *τὸν* *καὶ* *αὐτὸς* *interpretatus*: *id* *est*, *Matrimo-*  
 23. *nijs* *Terram*: siue *Influentialis* (*coniugij*, *Terrestre* *Signū*)  
 24. *Super* *suam* *Natiuam* *Terram*, *Eadem*, *ulterius* *Nutriti*  
 25. *non* *potest*, vel *Irrigari*, *quàm* *ad* *QVARTAM* *magnam*  
 26. *vereque* *Metaphysicam* *Reuolutionem* *Completam*. *Quo*  
 27. *finito* *Progressu*: *Qui* *aluit*, in *METAMORPHOSIM*,

B 3 Primus



Primus Ipse abit: Rarissimeque, post, Mortalium conspicitur oculis. Hæc, O Rex Optime, Vera est, toties decantata ( & sine Scelere ) MAGORVM INVISIBILITAS: Quæ ( ut Posteri omnes fatebuntur Magi ) nostræ est MONADIS concessa Theorij. Expertissimus

11. MEDICVS, etiam ex eisdem, facillimè Hippocratis My-  
 sticam assequetur voluntatem. Sciet enim, Quid, Cui, ADDENDVM ET AVFERENDVM sit: ut, ipsam

Lib. de Fide  
 titu.

Artem sub maximo MONADIS nostræ Compendio, & MEDICINAM ipsam contineri, Lubens deinde fateri

12. VELIT. BERYLLISTICVS, hic, in Lamina Chrystallina, omnia quæ sub (ælo LVNÆ, in Terra vel Aquis versantur, exactissimè videre potest: & in Carbunculo siue

13. Lapidè, Aëream omnem & Ignecam Regionem explorabit. Et, si VOARCHADYMICO, nostræ Hieroglyphicæ MONADIS, Theoria vigesima prima, satisfaciatur, Ipsique, VOARH BETH ADVMOETH, Speculandum ministrat: Ad Indos vel Americos, non illi esse Philosophandi gratia, peregrinandum fatebitur.

14. Deinde de ADEPTIVO genere ( quicquid vel ARIOTON Ars subministrare, vel polliceri possit; vel viginti Annorum maximi Hermetis labores sunt assecuti )  
 15. licet ad Parisienses, sua MONADE peculiari ( Anagogica Apodixi illustratum ) aliàs scripserimus: Vestre tamen Maiestati Regiæ constanter asserimus, ID OMNE, Analogico nostræ MONADIS Hieroglyphicæ Opere, ita ad vivum exprimi, ut Similius aliud Exemplum, humano generi non posset

Hermetis, Ostanis, Pythagoræ, Democriti, & Anaxagoræ quibusdam Mysterijs: In quæ, ex nostris Hieroglyphicis descendimus Demonstrationibus, non tanquam ab illis, fidem emendicantes in istis. Et istam tantam Raritatem, ita, ubique coniuncta Comitatur Bonitas: ut Nihil, vel apertè vel tectè, in hoc libello à nobis esse possumus, PROTESTEMVR, quod nõ Idem Honestum, sincerum, Dignitati Humanæ aptum sit: Pietatis perfectissima, Religionisque veræ studio Vilissimum. Et ut OPOTOMEIN certè, in tam arduis Mysterijs non potest, nisi Ille, Qui, eorum perfectissimam habet omnè Amplitudinem: Sic Nemo citius Infantiam suam, Malitiam, vel Arrogantiam proderet, quàm Ille, Qui, quicquam eorum quæ hic Vestre Sapientie Commendavimus, vel tanquam Impium Condemnare, vel tanquam friuolum Reijcere auderet. Cuius rei, cum nullum, vel Iudicio Acutiorem, vel Vsu Expertiorem: vel Auctoritate Potentiorem: vel Sinceritate Fideliorem, adducere quis possit Testem, quàm Summus Ille Regū Rex Omnipotens, Regem fecerit MAXIMILIANVM: Erit ergo mihi Vestra Augusta Maiestas instar aliorum Omnium: Cui, hæc nostra, Probata esse, haberi que Rata, non solum, Triobolarium multorum obturabit ora Grammaticarum: Sed etiam multorum Philosophantium eriget animos: vel humi, iam, propter tantorum Mysteriorum proclamata Incertitudinem, Lacerantes: Vel, propter Rerum Raritatem, Imperitorum Superba timentes Iudicia: Qui Bona cum Malis ( temerè, promiscue-

20. posset proponi. Quod, in seipsum, dupliciter, traducere debet: Ipsum, Scilicet, Dignificatum Glutire Opus: & Operis Imitari Dignificationem.

Nunc, Satis à me, ( Imò vereor, si hæc hominum audiret Vulgus, ne plus sitis, ) de Raritate nostri huiusce Muneris Theoretici, esse dictum, ( Triplicis Inclute Diadematis Honore ) Concedas Rex O Maximiliane: Eisdemque limitibus, eiusdem definiri Bonitatem. Satis ergo sit, ( Regum omnium Decus singulare ) hoc nostrum Munus, Dum, tam esse Rarum demonstraverimus diligentius, Neminem tamen ( licet Invidæ Lingua Petulantia Maledicentissimum quidem ) Auctum esse Æsopicam musitare posse. Tantum profecto abesse, ut iuste, illius Indignitatem ferat Calumniam, Modestissimi omnes Sapientissimi que fatebuntur Philosophi: quod non dedignabuntur Illi quidè, vnà mecum, Laudes & Honorem illi Phœnici accinere, ex cuius Solius Misericordiæ Alis, Rarissimas istas omnes cum Timore & Amore extraxerimus Theoreticas Plumas: contra nostram per Adamum introductam Nuditatem: Ut eisdem, Ignorantiæ asperimis quibusdam frigoribus, multò resistere mus aluciores: & Errorum Turpitudinem, à Philosophantium tegeremus oculis, Honestæ VERITATIS studiosissimi. Et quamvis Auctoritate aliqua humana, nullo modo, hic sumus freti, Sicubi tamen, Antiquissimi alicuius Philosophi, opportunè poterat nostro illustrari Lumine, aliquod notabile dictum vel Scriptum, ibi, illud amicè nostris exhibere Posteris, non recusavimus: Veluti in

Hermetis,

promiscueque, ex nominis sola Similitudine, ) condemnare solent Studia. Cum maximè deplorando ( interdum ) Optimorum librorum interitu. Quorum vtrumque, Reipub. Christianæ, plurimum, varijs temporibus, attulisse detrimenti, clarissimè constare potest. Apto nimirum ad tam magna tractanda Capeffendaque Ingenio, vel priori ratione perterrefacto: vel iam, quidem, cum Progressus baud mediocres fecerit, Rusticæ eiusdem & Superbæ, ab Imperitis Iudiciis, vniuerso tam nobili tamque diuino Mysteriorum condemnato studio. At alterius est loci, singulis Scientijs Honestis, suas comparare emulas: falsas illas quidem, Vmbratiles, Odiosas, Molestas, Hominumque Societati Inutiles. Quas, Solas, & ea ratione quæ vulgares captant homines & exercent: non Vulgari solum, sed Sapientissimi cuiusque Iudicio explodendas, condenandasque, & fatemur, & ita diligentissimè fieri, nos quoque, suademus. Sed, Qui, CORPORA illa, vel Esse nesciant, vel Ubi, vel Qualia sint; QUORVM ista tenuissima sunt Vmbra: Quo modo, Illi, Hominum non Vulgarium, non Vulgaria condemnare Studia, vel audent, vel saltè fure possunt? FIAT IUSTITIA. Unicuique, Quod Suum est, sic, tribuatur, in istis. Vulgaribus Sciolis, Artium Magnarum Vmbra non sectantibus solum, sed easdem etiam sceleratissimè ementientibus adulterantibusque: Nugas, Errorum, omnemque adscribamus Impietatem: At in Bonis Solidisque studijs Prouectioribus: & honestis moribus tum confirmatis, tum sua integritate Clarifimis: Vel,

C. Uim



Vim (ob leuem Vulgi Calumniam) Inferre: Vel eorum in Odium vocare Nomen, studiaq; vel in discrimē, Vitam: nō solum inhumanum id mihi (O Rex) Sed Iniustum & quasi Impium, Videtur. Nam, vt Corporum quorumcunque, omnes vbicunque Vmbrae, COMMUNES cum ipsis Corporibus TERMINOS habēt: (Quod Mathematicis est notissimum) Eodem modo, & hic, Phrases Loquendi, Scribendiq; Vmbrae, Verisq; ipsis Corporibus, COMMUNES esse, Permittunt SOPHI. Vbi, Imperiti, Temerarij, & Presumptuosi Simia, VMBRAS Captant solas, nudas, & Inanes: Dum Ipsi Sapientiores Philosophi, CORPORVM Solida fruuntur Doctrina & fructu gratissimo. Sicque verē, Illud, vsu uenire videmus: Vt Illis, Id quod habere se putabant, (Vmbatile,) tanquam non Solidum & Sincrum, ex manibus eripatur, iustissimē: & Corpora tractantibus, Vmbrarum omnis sit concessa honesta legitimaque Comprehensio & Cognitio. ΟΡΘΟΤΟΜΕΙΝ igitur oportet, (O Rex,) inter VMBRAM & CORPVS: & Vtriusque distinguere fines, Vires, & vsus, IUSTITIAE Ille est Gladius, Regius, Imperatoriusque: cuius, vt alia multa, ita, & hoc, est prestare Diuinum Munus. Et Arte profecto quadam, interdum, Ipsi Sophi, VMBRATILES figuras, intra ipsorum Corporum Similes anfractus libenter admittunt: ne Asinis in Hesperidum Hortos, ruditer irruentibus, electissimae praebeantur Lactuca, cum illis sufficiant Cardui. Ignosces mihi O Rex, Mundum de Iniustitia (ex Christi Auctoritate) arguenti.

Neque

## TYPOGRAPHO,

GVLIELMO SILVIO:

Amico suo singulari,

IOANNES DEE LONDINENSIS,

S. D. P.



IDES Amice mi, Optime Gulielme, Quam vnice charas, Praclarissimas habeam, Illustissimi Regis MAXIMILIANI Virtutes: Cui ex Cordis mei Scrinijs, Rara, excellentissimaque communico Arcana: Eaue ratione, illi communicanda Curaui, vt etiam Plures per Terrarum Orbem (tum in eius Honorem, propter eximias suas, Regiasque virtutes: tum vt Alij ex illo Sibi exemplum capiant: qui & Regijs Sapientissimē vacare Regnorum Gubernaculis: & Philosophorum tamen, Sophorumque Stupenda cumulate addiscere Mysteria potest) Plures, inquam, eisdem frui, Vestra Diligentia, & Fide queant. Duo igitur sunt, quae mihi es orandus maxime: Vnum, Vt vbique accuratam meam, in Literarum Varietate, Punctis, Lineis, Diagrammatibus, Schematibus, Numeris, aliisque, Imiteris, (quantum possis) Diligentiam: Ne, Idem Ipsum, quod Ego (DEI NVTV) peperit ex omni parte bene Formatum Corpus, Typographiae Negligentia, vel Mutilum, vel Deforme prodeat in Lucem: indignum

Neque haec, vlllo modo, hoc loco, hys Temporibus, Tua praesertim comemorata Sapientia, Parerga censerem volo: immo ne Superflua quidem. Atque haec haecenus. Hunc ergo meum MONADIS HIEROGLYPHICAE Factum (Conceptione quidē Londinensem, Natiuitate vero Antverpiensem) Vestra Serenissima Maestati, humillimē Offero: Obnixē à vobis contendens: vt eiusdem non Deditur mini, nunc quidem, fieri Compater: post verò, cum erit & etate grandior, & fide sua Commendabilior, in vestra semper vobis vt seruire possit praesentia. Pro vestro, deinceps Ego eundem haberi volo, O Clementissime REX: Qui, vt mihi visus es toto partus Tempore, Blandissimo Aspectu, ante oculos versari meos: ita, ea ratione, facilem mihi expeditumque huius in Lucem editionis, Laborem fecisti. Nam quem Annos prius continuos Septem, Mente gestavi mea, eundem, incredibili vestra ad tantum Interuallum, Virtute Magnetica, duodecim solum Dierum spatio, in hanc communem Auram, placidissimē sum Enixus. Quod, Felix, Fauisq; esse, tum vestrae Augustae Celsitudini, tum ardentissimis meis sincerissimae veritatis studijs, Concedat flamma Sacrosancta TRINITAS, Quae (in MONADIS Ineffabilis, Omnipotentia, ante omnia Saecula, fundata,) viuit regnatque Sempiterna: Cui Soli, omnis Laus, Honor, Virtus & Gloria, ab omni semper exhibeatur, decanteturque Creatura. AMEN.

Antverpia.

Anno 1584. Januarij, 29.

C 2

## AD TYPOGRAPHVM.

II

dignum, siquidē, Rege tanto; Indignum verē Philoiphantium Studijs, & laboribus, quos in eo penitissimē, sepiusque examinando, collocare volunt, Maximis. Cauere tamen satis, de isto, mihi Videor, Infortunio, dum te elegi, Istius nouiter Nati Operis Parentem Typographicum: qui omnibus modis, nitidum, suisque bene Compositum Membris, tua Curatura, emittere potes.

SECUNDVM, quod à te praestari Optarem, haud est leue, id quidem: Nimirum, Promiscuo vt hominum generi, hosce, nullo modo, in manus des Libellos. Non quod illis ego haec quidem, vel meliora, inuideam: Sed hoc inde oriturum mali Suspiciens: Non solum, quod, ex isto Labyrintho, Sceleris, nunquam extricare possunt: (Ingenium interea, Incredibilibus Argentes modis, pessimēque suis prospicientes Rei familiaris negotijs) sed etiā, quod, Alijs quoq; (illis inuium) vel, Ingredi suadebunt Iter: vel de eiusdem, veluti illis explorata, Certitudine, Sceleratissimē ementientur; Impostores, Hominumque Laruæ: Vel Denique, talia DEI MAGNALIA, Esse, Negare; Aut meam, rabidissimē accusare Sinceritatem audebunt: tunc tandem Desperabundi; Vt, primò, haec Mysteria, cum maxima Praesumptione aggressi sunt Temerarij. At in hoc tanti Momenti negotio, Si te bene à multis iam annis noui (vel propter amicitiam nostram:

C 3 vel



vel Reip. Christianæ Utilitatem; vel saltem propter  
Ipsius Sapientissimi MAXIMILIANI, Heroicas  
Virtutes, quæ nihil Commune cum Hominum  
Vulgari habent Sorte) Cauebis, Spero, ne Fidem  
tuam frustra requisuisse Videar. Cauebis tu  
quidem: &, per te, Honestissimi omnes  
Librorum Mercatores.  
Valcas.

*Ex Museo nostro Antverpiensi:  
Anno 1564. Januarij 30.*

## MONAS

## MONAS HIERO-

## THEOREMA IIII.

LVNÆ Hemicyclium, licet hic, Solari sit Circulo quasi Sa-  
perius Priusque: Tamen SOLEM tanquam Dominum,  
Regemque suum obseruat: eiusdem Forma ac vicinitate  
adeo gaudere videtur, vt & illum in Semidiametri æmule-  
tur Magnitudine, (Vulgaribus apparente hominibus,) &  
ad eundem, semper suum conuertat Lumen: SOLARI-  
BUSQUE ita tandem imbui Radijs appetat, vt in eundem  
quasi Transformata, toto dispareat Cælo: donec aliquot  
post Diebus, omnino hac qua depinximus, appareat cor-  
niculata figura.

## THEOR. V.

ET Lunari certè Semicirculo ad Solare complementum  
perducto: Factum est Vespere & Mane Dies vnus. Sit  
ergo Primus, quo LVX est facta Philosophorum.

## THEOR. VI.

SOLEM, LVNÆQUE, Rectilineæ Cruci, inniti, hic vi-  
demus. Que, tum TERNARIUM, tum QVATERNARI-  
UM, appositè satis, ratione significare Hieroglyphica, po-  
test. TERNARIUM quidem: ex duabus Re-  
ctis, & Comuni vtriusque, quasi Copulatio  
Puncto. QVATERNARIUM vero: ex 4. Re-  
ctis, includentibus 4. Angulos rectos. Singulis,  
bis, (ad hoc) repetitis; (Sicque, ibidem, secretis-  
simè, etiam OCTONARIUS, sese offert; quem, dubito,  
an nostri Prædecessores, Magi, vnquam conspexerint: No-  
tabisquæ maxime.) Primorū Patrum, & Sophorū TER-  
NARIUS, Magicus, CORPORE, SPIRITU, & ANI-  
MA, constabat. Vnde, Manifestum hic Primariū habemus  
SEPTENARIUM. Ex duabus nimirum Rectis, & Co-  
muni Puncto: Deinde ex 4. Rectis, ab Vno Puncto, sese,  
Separantibus.

## THEOR.

## MONAS HIEROGLYPHICA:

IOANNIS DEE, LONDINENSIS,

*Mathematicè, Magicè, Cabalisticè, Anagogicèque,  
explicata: Ad*


SAPIENTISSIMUM,

ROMANORVM, BOHEMIAE, ET HUNGARIAE,


REGEM,

MAXIMILIANVM.

## THEOREMA I.

 Er Lineam rectam, Circulumque, Prima, Sim-  
plicissimaque fuit Rerum, tum, non existentium,  
tum in Naturæ latentium Inuolucris, in Lu-  
cem Productio, representatioque.

## THEOREMA II.

AT nec sine Recta, Circulus, nec sine Puncto, Recta artifi-  
ciosè fieri potest. Puncti proinde, Monadisque ratione,  
Res, & esse coeperunt primò: Et quæ peripheria sunt affectæ,  
(quantacūque fuerint) Centralis Puncti  
nullo modo carere possunt Ministerio. — 

## THEOREMA III.

MONADIS, Igitur, HIEROGLYPHICAE Conspiciū  
Centrale Punctum, TERRAM refert, circa quam, tum  
SOL tum LVNA, reliquique Planetæ  
suos conficiunt Cursus. Et in hoc mune-  
re, quia dignitatem SOL obtinet sum-  
mam, Ipsum, (per excellentiam,) Circulo  
notamus Integro, Centroque Visibili.

 MONAS  
HIERO-  
GLYPH-  
ICA

## THEO-

## GLYPHICA.

## THEOR. VII.

ELEMENTIS, extra suas Sedes naturales, dimotis: Suos ad  
eadem Reditus, naturaliter, per Rectas facere lineas,  
Dislocatæ eorundem homogeneæ Partes, experientem do-  
cebunt: Absurdum igitur non erit, per 4. rectas, ab vnico  
Puncto, Indiuiduoque in Contrarias excurrentes partes,  
QVATVOR ELEMENTORVM, (in quæ Elementata,  
singula, tandem resolui possunt) innuere Mysterium. Hoc  
etiam notabis diligenter; Geometras docere, LINEAM,  
EX PUNCTI FLVXXV, produci: Nos hic simili ratione,  
fieri monemus: Dum Eleméntares nostræ Lineæ, ex S T I L-  
LAE, (tanquam Puncti, Phisici) continuo Casu, (quasi  
FLVXXV) in Mechanica nostra producantur Magia.

## THEOR. VIII.

QVATERNARIUM, præterea Expansio Cabalistica, se-  
cundum vsitatæ Numerationis Phrasin, (dum dici-  
mus, Vnum, duo, tria, quatuor) DENARIUM, summatim  
exhibet. Vt & ipse Pythagoras dicere solebat: Nam 1. 2. 3.  
& 4. decem conficiunt. Non temerè ergo, CRVX Recti-  
linea, (id est, Vigesima & Prima Romani Alphabeti litera)  
ex 4. fieri rectis iudicata, ad DENARIUM significandum,  
ab Antiquissimis Latinis Philosophis est assumpta. Locus  
etiam illi est ibidem definitus, Vbi FERNARIUS, vim  
suam per SEPTENARIUM ducens, illum statuit.

## THEOR. IX.

HOC autem nostræ MONADIS, SOLI, LVNÆQUE,  
optimè conuenire videbitur: cum eorundem per 4. E-  
lementorum Magiam, Exactissima in suas Lineas fuerit fa-  
cta SEPARATIO: Deindeque, per earundem Linea-  
rum Periphoras (Ad omnis enim datæ lineæ Magnitudi-  
nem, licet Circulum describere: per Geometriæ leges) Cir-  
cularis, in Complemento SOLARI, fuerit facta CON-

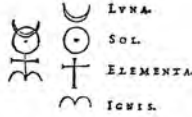
D IVNCTIO.



IVNCTIO. Tunc enim latere non potest, quantum nostrae MONADIS, SOLI, LVNAE QVE, Crucis DENARIA inferuiat Proportio.

## THEOR. X.

Dodecatemori Arietis, omnibus est notissima, quae est in Astronomorum usu (quasi Acioædes, Acuminataque) figura ista: Vt & ab hoc cæli loco, Triplicitatis Igenæ, notari Exordium constat. Adignis ergo ministerium (in huius Praxi MONADIS) requiri significandum, Arietis adiecimus Astronomicam notam. Sicque breuiter, nostrae MONADIS, vnam abfoluimus Considerationem Hieroglyphicam: quâ sic volumus, vnico Contextu Hieroglyphico proferri.



MONADIS ISTIVS, LVNA ET SOL, SVA SEPARARI VOLVNT ELEMENTA, IN QVIBVS DENARIA VIOEBIT PROPORTIO; IDQVE IGNIS FIERI MINISTERO.

## THEOR. XI.

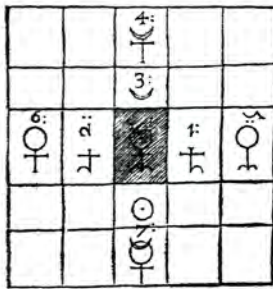
Arietis Nota Mystica, ex duobus Semicirculis, in communi Puncto connexis, constituta: Aequinoctialis Nycthemera loco aptissime assignatur. Viginti enim & quatuor Horarum Tempus, Aequinoctij modo distributum, Secretissimas nostras denotat Proportiones. Nostrae dico respectu Terræ.

## THEOR. XII.

Antiquissimi Sapientes Magi, quinque Planetarum, nobis tradidit Hieroglyphicas: Compositas quidem omnes, ex LVNAE vel SOLIS Characteribus: cum Elementorum aut Arietis Hieroglyphico Signo. Veluti istas,

Conspiciuntur Mercurius ille alter: Prioris quidē Vt Lunari scilicet Solarique Elementorum Cōpleta Magia, vt expressissimè nobis ipse Hieroglyphicus loquitur Nuncius, modò in illum oculos defigere, auremque illi præbere attentioem velimus. Et, (N. V. T. V. D. E. I.,) iste est Philosophorum MERCVRIVS ille Celeberrimus, MICROCOSMVS, & ADAM. At Solebant tamen Expertissimi Nonnulli, huius loco graduque SOLEM ipsum ponere. Quod nos hac nostra ætate non possumus præstare: nisi ANIMAM aliquam à CORPORE, arte Pyronomica Separatam, huic Operi Χριστονομῶν præficeremus. Quod & factum est difficile: & propter Igneos, Sulphureosque quossecum adfert halitus, periculosissimum. Sed illa, certè, ANIMA, mira præstare poterit. Nimirum, tum ad LVNAE, Discum, (Vel MERCVRII saltem) LVCIFERVM; Immo & PYROENTA, Indif-

TOTIVS  
ASTRO-  
NOMIAS  
INTERIO-  
RISSIMA  
MONADIS  
EAPRIM-  
EIVSALIS



DIS HIEROGLYPHICAE, respōdeat ANATOMIA ista.

## THEOR. XIII.

EX SOLE & LVNA, totum hoc pendere Magisterium iam clarè confirmatum est. Huius, etiam Term maximus ille

istas, quas hic videtis figuratas. Quas singulas modo Hieroglyphico, ex nostris prius iactis Fundamentis, non erit

+	Saturnus.	☿	Mars.
+	Jupiter.	♊	Venus.
+	Mercurius.	♋	Mercurius.

explicare difficile. At primum, de ijs quæ Lunæ habet Characterem, nos nunc Paraphrastice agemus: de Solaribus deinde. LVNARIS nostra Natura, dum per Elementorum scientiam, circa nostram sit semel reuoluta Terrâ, SATVRNVS mysticè dicebatur. Et eadem de causa, IOVIS quoque habebat nomen: istamque retinebat figuram secreto-rem. Et Lunam, tertia elementatam vice, obscurius sic notabant. Quem, MERCVRIVM vocare solent. Qui, quàm sit LVNARIS, videtis. Istum, QVARTA Reuolutione produci, licet Quidam velint Sophi: nostro Secreto proposito tamen, non erit id Contrarium: Modò Spiritus Purissimus Magicus, loco Lunæ, τῆς λευκῆς τοῦ οὐρανοῦ Opus: & sua virtute Spirituali, nobiscum SOLVS, per Mediam quasi Naturalem diem sine verbis, Hieroglyphicè loquatur: in Purissimam Simplicitatimque, à nobis præparatam Terram, Geogamicas, istas 4. introducens, IMPRIMENSQVE figuras: vel illarum loco, illam alteram.

## THEOR. XIII.

MARTIS ergo Character Mysticus, an non ex SOLIS & ARIETIS, Hieroglyphicis, est conflatus? Elementali (partim) interueniente Magisterio? Et VENERIS, quæso, an non ex SOLIS, & Elementorum Pleniore Explicatione? Isti ergo Planetæ, SOLEM respiciunt πρὸς τοὺς οὐρανούς, Opusque Ἀναλογισμῶν: In cuius progressu fit tandem

D 2 CUN-

ille Hermes, nos olim admonuit: Eius Patrem, SOLEM, esse, asserens: LVNAM autem, Matrem: Nutriti verò Scimus in TERRA LEMNIA. Radijs nimirum LVNARIBVS & SOLARIBVS, Singularem circa Eandem, exercitibus INFLVENTIAM.

## THEOR. XV.

SOLIS proinde LVNAE QVE circa Terram Labores, Philosophis proponimus Considerandos. Huius quidem, quo modo, dum in Ariete versatur SOLARE Iubar: Ipsa tunc in Proximo (scilicet Tauri) Signo, Lucis nouâ recipiat Dignitatem: EXALTETVRQVE Supra Innatas sibi vires. Quam (præ alijs notabilem magis) LVNARIVM, Vicinitatem, Characterem quodam mystico explicabant veteres: TAVRI, insignito Nomine. Quam, quidem, LVNAE esse EXALTATIONEM, vsque ab ipsa prima Hominum ætate (inter Astronomorum Placita,) memorie esse produrum, notissimum est. At Intelligent Mysteriorum Illi soli, qui absoluti euasere Mysteriorum Antistites. Vt & simili ratione, VENERIS esse DOMVM, dixerit TAVRVM: Casti nimirum Prolificique CONIVGALIS AMORIS: Sic enim ἡ φύσις, τῆς οὐρανοῦ τέρας: Vt Magnus ille OSTANES in Secretissimis suis Recondidit Mysterijs.

SOLIS verò, qua ratione, Ipse, post Aliquas sui Luminis, admissas Eclipses; MARTIVM Robur accipit: & in eiusdem quoque DOMO (Nostrò scilicet Ariete) veluti in sua Triumphare dicitur EXALTATIONE. Quæ Secretissima Mystera, nostra etiam MONAS clarissimè, perfectissimèque demonstrat: TAVRI quidem ista que hic est depicta Hieroglyphica figura: & illa MARTIS: quæ 12. & 13. Theoremate adduximus: quæ SOLEM Recta in ARIETEM tendentem, indicat. Ex præfenti autem Theoria,

Taurus	♉	LVNAE EXALTATIO.
Aries	♈	ELIMENTA.
	♈	SOLIS EXALTATIO.

D 3 Alia



Alia nostræ MONADIS sese offert Anatomia Cabalistica: cuius ista est vera Artificiofaque explicatio. LVNAE, SOLISQUE EXALTATIONES, MEDIANTE ELEMENTORVM SCIENTIA.

## ANNOTATIO.

Duo hic maxime notanda esse Censeo: vñ, quod Tauri Hieroglyphica ista figura, nobis Græcorum Dipthongum *υ*, ex altere representet, Primæ Declinationis, Gignitum semper singularem Terminationem. Secundo, ex apta Metathesi Locali, dupliciter nobis ALPHA commensurat: Circulo & Semicirculo Tangentibus solem, vel se mutuo (ut hic) /secantibus.

## THEOR. XVI.

Iam nobis de CRUCE, paucis, ad nostrum propositum, est Philosophandum. CRUX nostra, licet ex duabus Rectis (ut diximus) & æqualibus illis quidem, confecta sit: non se mutuo tamen in æquales dissecant longitudines. Sed tum æquales, tum in æquales partes, in Mystica nostræ Crucis distributione, haberi volumus. Innuentes, in Binarum ita sectarum potestate (eò quod æqualis sunt Magnitudinis) CRUCIS quoque Aquilateræ, virtutem latere. Generalissimè enim, CRUCE, ex æqualibus Rectis, fieri iussa, æquali profecto linearum Decussatione, eam fieri debere, NATVRAB quædam requirit IVSTITIA. Secundum cuius Iustitiæ Normam, de Aquilatera CRUCE (qualis est Latini Alphabeti litera vigesima prima) hæc quæ sequuntur, perpendenda proponemus. CRUCIS, Rectilineæ, Rectangulæ, & Aquilateræ, Si per commune sectionis punctum, & Contrapositos angulos, Recta vbi-  
cunque transire concipiatur: Ex vtraque parte, sic transeuntis Rectæ, Crucis faciæ partes, sunt omnino similes & æ-  
quales: Quarum figuræ, eadem sunt, cum illa Latinorum litera, quæ Vocalium esse QUINTA, recepta est, & ad QVINARIVM denotandum, apud Antiquissimos Latinorum Philosophos vñtatisima erat: Idque haud absurde ab illis:

excrecere apertissimum est. At si, ex Quadratorum Legge, Mutuam patiantur Multiplicationem, Bis Mille, Quingenta nobis reddent: Qui huius QVADRATVS, ad prioris Circularis Numeri Quadratum, comparatus: & eidem Applicatus, etiam CENTENARIVM, denuo restitueret: ut & ipsa CRUX, secundum Sui DENARII Potentiam, se explicans, CENTVRIO esse agnosceretur: Et tamen cum sit nisi Vnicus ipse CRUCIS Character: Vnum quoque representat: Hic ergo (preter alia notatu dignissima) ab istis CRUCIS Theorijs, Numerare, & Progredi iam sumus edocti ad hunc modum: Vnum, Decem, Centum. DENARIA sic nos Euchente CRUCIS Proportionem.

## THEOR. XVII.

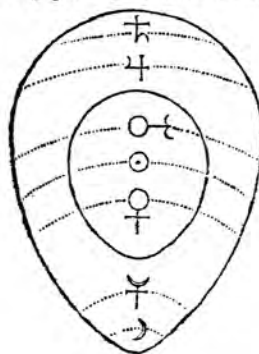
VT ex Sexto Theoremate liquere potest, in CRUCENOstra QVATVOR rectos considerari, angulos: Quorum vnicique, QVINARIJ attribueri significationem, præcedens doceret Theorema: Vno quidem locatis modo: At alterum obtinētibus Situm; Idem Theorema, QVINQVACENARIJ Numeri, fieri Hieroglyphicas Notas admittit: Ita, euidētissimum est, CRUCEM, DENARIVM notare vulgariter: Tum in Latini Alphabeti ordine, literam esse vigesimam primam: (Vnde est factum, quod, Sophi, Meeubales, dicti, viginti vnum, per eandem Significabant Literam: ) Denique, & Simplicissimè considerari posse: ut Vna Nota, esse conspicitur, qualemunque & quantamcunque aliam habet potestatem. Ex quibus omnibus, optima Demonstratione Cabalistica concludi posse videmus: CRUCEM nostram, Mystis, DVCENTA, QVINQVAGINTA DVO, mirabili Compendio Significare posse. QVATER enim QVINQVE; QVATER QVINQVAGINTA; DECIM: VIGINTI VNVM; & VNVM: DVCENTA QVINQVAGINTA DVO efficiunt.

ab illis esse factum Censeo; cum sit Denarij nostri, Conformis Medietas. Ex illius ergo figuræ, Sic duplicatæ (ex hac Hypothetica Crucis diuisione) prouenientis, ea ratione, qua QVINARIVM vtræque representant, licet erecta altera, Altera autem hic sit euerfa) Monemur, Radicum Quadratarum hic imitari Multiplicationem Quadratam: (quæ hic mirabiliter in NUMERVM CIRCVLAREM incidit, scilicet QVINARIVM) Vnde produci certò constat, VIGINTI & QVINQVE: (ut & ipsa litera, est vigesima: & Vocalium Quinta.) Nunc vero alium situm ipsius CRUCIS æquilatere considerabimus: istum nimirum: qui nostræ MONADICAE CRUCIS Situi est similis: Similem autem hic fieri Crucis Diuisionem bipartitâ (ut supra) supponimus. Vnde alterius literæ, latini Alphabeti, se monstrat etiâ geminata figura: erecta vna, euerfa, & auersa, altera: Que (ex Latinorum vetustissima consuetudine) ad QVINQVAGINTA representandum, in vsu est. Istud, inde mihi primò statutum videtur: Eò quod sit & Illa quidem QVINARIJ, Nota; ex nostro Crucis DENARIO, essentialiter desumpta: at eo situ Locatæ, quo, omnium Mysteriorum Maximi, ipsa CRUX, est Consummatissima, Hieroglyphica Nota: Vnde DENARIJ Potestatem, in sua QVINARIA Virtute COMPLECTENS, QVINQVAGENARIO NUMERO tanquam suo Partui, gratulatur. O, MI DEVS, QVANTA HÆC MYSTERIA? & Nomen illi, EL. Immo & hac ratione quoque, ipsam Denariam Crucis virtutem respicere videtur; quod Medio Loco, inter primam Alphabeti Literam, & ipsum Crucis Denarium sit constituta: & ab alterutra, ipsa sit, ordine, Decima. Et cum in CRUCE, duas eiusmodi integrales esse partes ostendimus (Numeralem nunc solum earundem vim Considerantes) CENTENARIVM inde excrecere

ficiunt. Quem Numerum, duabus adhuc alijs rationibus: ex præmissis ut nos elicere possumus: ita Cabalisticis Tyronibus, eundem commendamus eruendum: breuitati sic Studentes: Eiusdè tamen Magistralis Numeri, variam productionem artificiosam, Philosophorum dignam Iudicantes Consideratione. Nec vos aliam, hic, Mystagogiam Celabo, Memorabilem. CRUCEM nostram in duas alias literas, se Distribui Passam, Videntes: Si, ut Numeralem earundem virtutem quodam modo perpendimus prius, ita vicissim nunc ILLARVM VERBALEM VIM, CVM IPSA CRUCE, CONFEREMVS, quod inde Oriatur LVX: VERVM, Finale & Magistrale (ex illa TERNARIJ, in Vnitatem Verbi, Conspiratione & Consensu) cum summa Admiratione, Intellegemus.

## THEOR. XVIII.

EX duodecimo & decimotertio Theorematis nostris colligi potest, Cælestem Astronomiam, INFERIO-

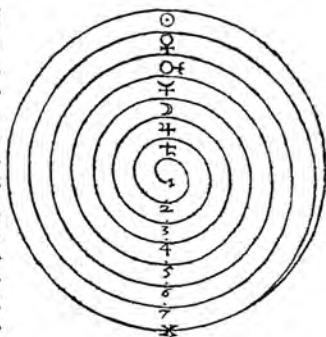


RIS esse quasi Patrem & Magistrum. Subleuatis ergo in Cælum oculis Cabalisticis (ex Prædictorū Mysteriorū Theorica Illuminatis) talè ad amussim nostræ MONADIS, conspiciemus ANATOMIAM: In NATVRÆ LVMINE, VITAQUE se sic nobis semper ostendētem. Et suo pte NVTV, Secretissima huius



iusce Physicæ ANALYSEOS Myſteria, apertiſimè de-  
gentem. OVI autem figuram, iſti COORDINATIO-  
NI adhibere: Cæleſtis NVNCII, dum Theoricos, Cæ-  
ſteſque Geſtus, ſumus aliquando Contemplati, fuimus e-  
docti. OVALI enim, Ipſum, in Aethere, ſuo Curſu Fi-  
gurare Circuitionem, Aſtronomis eſt notiſſimum: Et, cum  
Dictum, Sapienti, ſat eſſe debeat: En noſtras huius Cæle-  
ſtis Conſilij Interpretationes (ſic Hieroglyphicè propoſi-  
tas:) prædictis omnino Conſentaneas. HINC Monij,  
diſcant Miſerrimi Alchimiftæ, ſuos agnoſcere Errores va-  
rios: Quæ ſit Albuminis OVORVM AQUA: QVOD EX  
VITELLIS OLEVVM. Quæ OVORVM CALX: HINC,  
Imperitiſimi illi Impoſtores, cum illorū Deſperatione, In-  
telligant: Aliaque his ſimilia, perplura. HIC PROPOR-  
TIONATVM A NATVRA, FERETOTVM HA-  
BEMVS. Hoc illud eſt OVVM AQUILINVM, Quod  
SCARABEVS, olim diſrupit: Propter INIVRTIAM, quā  
Timidis Brutiq; Hominibus, Illius AVIS Violentia & Cru-  
delitas intulit: Licet ad Scarabei Antrum (Auxilij Implo-  
randi Gratia) aliquibus confugientibus, non inde tamen  
liberatis: Sed ipſe ſolus Scarabeus, hanc ſibi vindicandam  
INIVRTIAM, modis omnibus, exiſtimans: Vt erat alaci  
animo, Conſtantiq; Voluntate paratus, ita, ad id præſtan-  
dum, nec Viribus carebat, nec Ingenio: Vnde, varijs Con-  
atibus AQUILAM dum perſequeretur Scarabeus: Subti-  
liſſima FIMI Arte vſus, Illius tandem (vel in Iouis Gre-  
mio depoſitū) OVVM, in TERRAM PRÆCIPITARI  
adeoque DISRUMPI effecit. Et eadem, aliæ ratione  
Aquilinam tandem totam Speciem, è Terris deleuiſſet  
Scarabeus, niſi, (malum tantum Præcauens,) Iupiter, effe-  
ciſſet: Quo ANNI tempore, Aquilæ ſua ſollicitè curat OVA,  
Nulli vt circumuolent SCARABEI. Illis tamen Con-  
ſulcrem, qui iſtius AVIS vexantur Crudelitate, ab ipſis  
Heliocan-

Heliocantharis (qui ita certis Temporum Curriculis lati-  
tando viuūt) Viliſſimam artē diſcere: Quibus, iam licet nō  
faciant ipſi, eſſet tamen longè gratiſſimū, ſuis INDICIIS  
& Signis, de ſuo Inimico, Vindictam ſumi poſſe. Et hic (O  
Rex) non Aefopum conari me vt agam, Sed Oedipum, Fa-  
terentur, ſi adeſſent, Illi, quorum Mentes, ita de Naturæ  
Summis Fabulari Myſterijs, primò ſubiuit. Eſſe profe-  
ctò quosdam noui, qui SCARABEI ARTIFICIO, Si  
haberent DISSOLVTVM AQUILINVM OVVM,  
CALCEM eiſdem, cum Albumine puro, totoque TEM-  
PERARENT primò. Deinde illud TEMPERAMEN-  
TVM, VITELLI liquore toto, artiſcioſo ordine, obli-  
nirent: voluendo, reuoluendoque: Vt Scarabei ſuas con-  
glomerant Pilas. Ita, magna fieret OVI METAMOR-  
PHOSIS: ſam ſcili-  
cet diſparète, & quaſi  
inuoluto ALBUMI-  
NE ipſo (illis multis,  
veluti Helicis Reuo-  
lutionibus factis) in  
ipſo VITELLINO-  
SO LIQVORE. Cu-  
ius Artiſcij, tale Hie-  
roglyphicum ſignū,  
NATVRAE haud  
diſplacebit Oecono-  
mis. Sæculis priori-  
bus, multum eſſe à  
graviſſimis, & Anti-  
quiſſimis celebratū  
Philoſophis, tale Artiſcium, legimus: certifiſimum & viliſ-  
ſimum. Anaxagoras certè, ex hoc Magiſterio, excellentiſſi-  
mam, Poſt, fecit Medicinam: vt in ſuo *πρότερον ποσόν ποσόν*



E 2 xlii

non libello videre licet. Nihil hic eſſe extra noſtræ MONA-  
DIS virtutem Hieroglyphicam, qui animum iſtis Myſterijs  
ſincerius applicat, clariſſimè perſpicit.

## THEOR. XIX.

QVOD SOL & LVNA, omnibus cæteris Planetis, longè  
fortius, in inferiora cuncta Elementata Corpora, ſuas  
Corporales infundant Vires: Omnium rerum Corporati-  
rū ANALYSIS PYRONOMICA, Effectu demonſtrat:  
LVNAE dum reſundunt Aqueum Humorem: SOLIS  
QVE Igneum Liquorem: quibus, Rerum Mortalium Suſte-  
tatur CORPVLENTIA TERRESTRIS.

## THEOR. XX.

LICET ſatis bona ratione Hieroglyphica, ſuprà, demonſtra-  
uimus, ELEMENTA, per Lineas Rectas ſignificari: Hic  
tamen de CRVCIS noſtræ PUNCTO quaſi CENTRA-  
LI, Exaetiſſimam dabimus Speculationem. In TERNARII  
noſtri Conſideratione, nullo modo, Illud Abefſe po-  
teſt: in eo noſtri BINARII Situ. Si enim abefſe poſſet,  
Quis (Diuinæ Imperitius Matheticoſ) contenderet: Abefſe  
ſupponat. Non erit ergo Reliquus, BINARIVS noſter:  
Sed emerget QVATERNARIVS: Puncti illius Ablatio-  
ne, Diſcontinua Linearum vnitate. At Binarium eſſe Re-  
liquum, vnā nobiſcum ſuppoſuit Aduerſarius noſter: Erit  
ergo & BINARIVS, idem, & QVATERNARIVS, eade-  
dem conſideratione. Quod, *non aduocatur* eſſe, ſatis eſt  
Maniſeſtum. Adeſſe ergo ex omni Neceſſitate, debet illud  
PUNCTVM, quod cum BINARIO noſtrum Cōſtituat  
TERNARIVM: nec Aliud quid eius loco SVBSTITVTA  
poſteſt. Non tamen eſt de Hypoſtatica Proprietate, ipſius  
BINARIJ: nec aliquo modo Pars. Quod non ſit Pars,  
hinc demonſtrat. Omnes Linæ Partes, ſunt Linæ. At  
illud eſſe PUNCTVM, hypotheſis confirmat. Non ergo

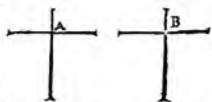
BINA-

BINARIJ illius Pars aliqua: Vnde multo minus de Hy-  
poſtatica Proprietate Binarij. Proinde NOTANDVM eſt  
maximè, quod & Propriam Habeat HYPOSTASIM: Et  
nihilò minus tamen, in ipſis noſtri BINARIJ Longitu-  
dinibus LINEARIBVS, cōtineatur. Et quia, Sic, VTRIS-  
QVE videtur eſſe COMMVNE: QVANDAM, & IPSVM,  
BINARIJ, SECRETAM RECIPERE IMAGI-  
NEM cenſeri. Vnde, QVATERNARIVM, Hic, DE-  
MONSTRAMVS, IN TERNARIO QVIESCENTEM.  
Tu, mi Deus, mihi ignoſcas obſecro, Si erga tuam nunc  
Peccauerim Maieſtatem, tātum, in Publicis Scriptis, Reue-  
lans, Myſterium. Sed Spero, quod, Soli, qui ſunt Digni illud  
verè Intelligent. Pergamus nunc ad noſtræ CRVCIS,  
illum, quem aſignauimus QVATERNARIVM. Vbi an  
Abefſe illud PUNCTVM poteſt, quod IBI Representa-  
tur, perpendamus. Mathematica profectò nos docet remo-  
ueri poſſe. Nam non Solum, EO ſeparato, RELI-  
QVVS Eſt noſter QVATERNARIVS: Sed cum DI-  
STINCTIOR longè, tum CLARIOR in omnium ocu-  
lis erit FACTVS. NVLLA SVAE SVBſTANTIA-  
LIS PROPORTIONIS RECEDENTE PARTE:  
SED SVPERFLVO, ET CONFVSIONIS PUNCTO,  
SIC DAMNATO, RELECTO QVE. O Omnipotens  
Diuina Maieſtas, QVANTAM TVIS APICIBVS, ET  
IOTIS, IN TVA DESCRIPTIS, DISPOSITIS QVE  
LEGE INESSE SAPIENTIAM, ET INEFA-  
BILIVM MYSTERIORVM INFINITATEM, CON-  
FITERI COGIMVR MORTALES: SI MAXIMA  
TERRENA SECRETA ET ARCANAE, VNIVS IS-  
TVIS PUNCTI, A ME, (AT IN TVO LVMINE)  
LOCATI ET EXAMINATI, INDICIO VA-  
RIO, EXPLICARI ET FIDELISSIME DEMON-  
STRARI QVEANT? PUNCTI videlicet, in TERNARII

E 3 xlii

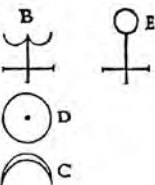


rio diuino, nullo modo SUPERFLVI:AT PUNCTI  
in QVATVOR ELEMENTORVM REGNO, confide-  
rati, FAECULENTI quidem, CORRVTIBILIT, TENE-  
BRICOSI. O Terque, Quaterque Beatos Illos,  
qui illud TERNARI, (quasi COPVLATIVVM) ADI-  
PISCI possunt PUNCTVM: & illud QVATERNARI,  
TETRVM & SUPERFLVVM, AMANDARE: Te-  
nebrarumq; Relinquere Principi. Sic, ad CLARITATEM  
NIYEA, & ALBARVM VESTIVM Ornamenta per-  
ueniemus, O MAXIMILIANE: Quem, Deus, (ista  
Mythagogia, aut Austriacae Familiae aliquem) Maximum, ali-  
quando faciat (vel me quidem in Christo Dormiente) ad  
tui Tremendi Nomini Honorem: in istis, Istis, (Puncti in  
TERRIS SUPERFLVI,) abominandis Tenebris, & vl-  
terius, intollerabilibus. Sed ne Ipse iam Superflua (non  
apto scilicet loco) profundam verba, intra Propositi mei  
Cancellos, aditum, nunc me recipiam. Et, quia, illis Ser-  
monem iam absoluerim, quorum Oculi in eorum Sedent  
Corde: Nunc mihi ad illos couertenda Oratio est, quorum  
Corda in coru adhuc prominent oculis. Quae hoc loco di-  
ximus, En CRVCIS adscripta figura, aliquo modo represen-  
tare potest. Primum, de PUNCTO, in Binis Aequalibus LZ-  
NEIS (aequaliter & inaequaliter decussatis) NECESSARIO:  
Veluti hic, ad A. Deinde, ad B (quasi quandam Puncti su-  
perflui ablati, Vacuitatem) distin-  
ctas videtis, QVATVOR rectas  
Lineas: a PUNCTO, prius illis co-  
muni, SEPARATA: Illis, inde,  
nullo quoniam sui detrimento.



Ista est via, per quam Nostra MONAS, per Binarium, TER-  
nariumq; progrediens, in QVATERNARIO Pu-  
tificato, sibi Vni restituatur, per Aequalitatis Proportio-  
nem. (Quodque enim Totum, suis omnibus partibus est  
Aequale.)

(hoc nouo modo Locatam) in Ana-  
tomica Membra B.D.C. Vbi, in illo  
nouo TERNARIO; ipsius D, & C,  
vel Rusticis quidem, sunt notae FI-  
GVRAE. At ille TERTIVS, qui per  
B designatur, non tam facile a Cun-  
ctis cognosci potest. Nec illud qui-  
dem leuiter est considerandum: illas



1. tam notas FORMAS, D, & C, sepa-  
ratas diuersasque ab illo B, ostendere ESSENTIAS: Se-  
cundo, quod istius C, cornua, deorsum, quasi TERRAM  
versus conuerti cospiciantur: Et, D illius, ea pars quae ipsam  
C, illuminat: versus terram, deorsum scilicet, respicit: in cu-  
ius solius Centro, est Visibile PUNCTVM: verè TERRE.
2. STRE. Et Quod vtraque Denique D & C, ad Inferiora ma-  
gis loca, hic suum Hieroglyphicum faciunt Indicium, quam  
B. Terra autem, Hieroglyphicè, STABILITATEM, &  
FIXIONEM nobis potest. Qualia ergo sunt D, &  
C, inde, concludendum relinquo. Vnde etiam Magnum  
nunc notare SECRETVM, Quisq; potest: de Priore SOL-  
E & LVNA, quae diximus, quo modo hinc Interpretatio-  
nem plenior, & maxime necessariam, recipere possunt  
illis quidem, usque in hunc locum, sursum politis: Lunari-  
busque Cornibus sursum eleuatis. Sed de hoc Satis. TER-  
TIUM nunc illius, iuxta nostrae Hieroglyphicae Artis Funda-  
menta examinemus NATVRAM. Primum, in Capite gestare  
videtur LVNAM DUPLICEM. Vel Arietem, nostrum, (sed  
inuersum Mysticè.) Deinde Elementorum habet annexum  
Hieroglyphicum Signum. Quantum ad LVNAM Du-  
plicatam attinet: Sic (iuxta Materiam subiectam) explicari  
potest: DVPLEX LVNAE GRADVS. De gradibus lo-  
quimur illis, quales Physices Periri, QVATVOR tantum  
inter omnes possint inuenire Creatas NATVRAS: Nimi-  
rum

Aequale.) Hocque dum fiat, nihil interea Externarum ad-  
mittit, Nostra MONAS, Vnitatum: Numerorumque: Cum  
ipsa sibi exactissime Sufficiat: Suis absolutissima Numeris  
omnibus. In quorum Amplitudinem, tum Magicis dif-  
funditur modis: tum non vulgari, post, Artificis Industria,  
& maximo Ipsius Monadis Emolumento, (in Dignitate &  
Potentia) ad suam Primam Propriamque Restituitur MA-  
TERTIAM: interim, quae ad genuinam hereditariamque  
suam non spectant Proportionem, omni modo & diligen-  
tia, reiectis, reiectisque in aeternum Facibus.

## THEOR. XXI.

SI, Quod in nostrae MONADIS Reecessibus, Interius Late-  
bat Inuolutum, esset id quidem in Lucem erutum: comu-  
tatisque vicibus, eiusdem Partes Primae, quasque Exterio-  
res, Loco Includerentur Medio, Qualis inde fieret MON-  
ADIS Philosophica Transformatio, Superius Vidistis:  
Nunc verò, Mysticæ MONADIS, aliam vobis propone-  
mus Localem Commutatione: Partibus illis, vnde SUPER-  
IORVM PLANETARVM, Characteres nostri Hieroglyphici,  
sepe nobis obrulere prius, Sursum hic erectis: eaq; ratione,  
reliquis quidè deinceps Planetis, eum singulis Sortientibus  
Situ, què illis Plato adscribere ferè visus est:  
Si ritè ex Positione ista desumantur. In ipso  
enim Acumine Arietino, Conueniunt Saturnus,  
Iupiter, Mars: deinde descendendo, Crux  
Veneri Mercurioque inferuit. Sequuntur tan-  
dem ipse Sol, & Infima, LVNA. Sed haec alio  
sunt ventilanda loco: Nostrae tamen MONA-  
DIS hocce nolui celare Thesauros Philoso-  
phicos: Sicque vnam rationem dare, cur ita MONADIS mu-  
tari Situm, consultum duximus. Sed, alia, quae in rem ve-  
stram esse scio, Videte. Auditeque, de hoc Situ, maiora:  
paucaque explicanda. Distribuiamus igitur MONADEM,  
(hoc




rum ESSE, VIVERE, SENTIRE, & INTELLIGERE. Primos ergo Duos istorum Gradus, huic inesse anno-  
tantes: Sic dicemus: LVNA EXISTENS, VIVA. Vitae ve-  
rò Quidam per Morum definiunt. MOTVS autem Sex  
sunt notissimae Species. CRVC certe quae adiuncta est: Ele-  
mentorum hic requiri Notat Artificium. Præterea, in  
istis nostris Theorijs, vt SEMICIRCVLVM, LVNAE ef-  
fe Hieroglyphicum sapissime tradidimus: Ita & Integrum  
Circulum, SOLEM significare: hic autem, duo sunt Se-  
micirculi; Sed SEPARATI (ad commune PUNCTVM  
Copulati tamen) qui, si aptè coniungantur (vt arte possunt  
quidem) SOLAREM nobis Circularemque referre pos-  
sunt Plenitudinem. Ex istis simul consideratis, sic Summa-  
tim, Hieroglyphicè, nos hanc proferre posse Sententiam  
patet. LVNA EXISTENS VIVA, PER ELEMEN-  
TORVM TRACTANDA MAGISTERIVM: HABENS  
POTENTIAM, VT SOLAREM REPRESENTET  
PLENITVDINEM, SVIS SIMVL ARTE CONNE-  
XIS SEMICIRCVLIS. Compleatur ergo: Fiatq; ille,  
(quem diximus) CIRCVLVS: vt, per E literam, hic an-  
notauimus. Memores ergo sumus, primò hunc SOLAREM  
GRADVM, non Natura nobis fuisse obuium, sed ARTI-  
FICIALEM, FACTIVMQUE VIAM esse: Et eum qui-  
dem, nobis se obrulisse primo aspectu, & Natura sua, (vide-  
licet in B) suis Partibus Laxis, Fluxus, dissolutis; non SOL-  
IDE in solarem Speciem Compactis. Deinde horum Se-  
micirculorum Semidiametrum, non esse æquale Semi-  
diametro D & C (nobis ita natorum, & omnibus Notissi-  
morum) sed Minorem multo. Vnde Clarum est: non esse  
tantæ Amplitudinis, istum B, quantæ sunt ipsa D, C. Et hoc  
bene nobis confirmat E ipsum: opere isto Circularem, à B, in  
Speciem E, promotam. Nam inde nobis emergit VENERIS  
solum Character. Apertum ergo iam fecimus, Hieroglyphi-  
cis istis



cis istis Syllogismis: Ex B, non sperandum nobis verum D, Nec fuisse primò veram C, in natura B: Vnde nō fuit VERA, LVNA, vna. De VITA ergo & Motu quoq; iā dubitare potes: an verè & Naturaliter, sic se habeant: Erunt tamē, ut iam Prudentibus Elucidauimus, ad minus ANALOGICA quidē, OMNIA, quæ simili (de B) dicuntur Phrasi: vt & superius, quæ de C, & D, perfrinximus breuiter, ANALOGICÈ. Ipsi B, cum suis ELEMENTIS, Propriè conueniunt. Quæ de Arietis etiā Natura adduximus, hinc debet exactè cōuenire: cum eandē illius in suo capite (licet inuersā) gesserit Figurā: vt & Elementorū eadē Nota Mystica, ipsi B adiungitur.

Cum ex hac tamē Anatomia videmus, quòd ex vnico nostræ MONADIS corpore (tali dissecto arte) iste nouus prodierit TERNARIVS: Inde, dubitare nō possumus, Eiusmodi MEMBRA, mutuum inter se amplexura SYMPATHIAM: VNIONEMQVE MONADICAM ABSOLVTISSIMAM, sua quasi sponte, admittitura: Ita in istis MEMBRIS, MAGNETICA virtus est vegeta.

Hoc denique annotare libuit, (animi recreandi gratiā) Quòd ipsum B, nobis, RVSTICAS, tot literas expeditissimè exhibet, quot Puncta, sursum, conspicienda in Capite, & quasi Fronte gerit: istas scilicet tres:  vt & alias quasi sex: (Summatim autē ter tria) RVDES valde & impolitas, fluxiles volubilesq;: vt, ex Semicirculis, vno vel pluribus, eadē esse factas videtis. Sed Expertorum literatorumque manibus inest firmior Stabiliorque ISTAS FORMANDI LITERAS Ratio, Mysteriorū infinitatē, hīc ante oculos habui: sed volui cum hoc Ludicro, istam abrumperē Theoriam. Haud parū tamen me quorundā promoturū Conatus intelligo: Si (priori suo Mystico Situi, restituta nostra MONADE: Composuissēque Artificiosè singulis Mēbris) Saltem moncam eisdem, horterque: accuratius, NVNC cruetur, QVIS fuit IGNIS ille ARIETINVS, TERTI-

PLICI-

vt Videtis: Ex Recta enim, Circulo & Semicirculo, Verū illius, Mystica quæiā nos primi docemus, Symmetriam (licet supra etiā monuimus ex Circulo & Semicirculo eandē fieri posse: omnia tamen in idē recidunt propositū Mysticum) At, λ, & δ: Primū quidem, aliorū sunt Vasorum quasi Imagines: (λ, quidem VITREI: δ autē, Terrei.) Sed, secūdo in loco, λ, & δ, nos memores reddere possunt, cuiusdā Pictilli & Mortarij, ex Materia (verè) tali præparandorum, Vt cum eisdem Margaritis Artificiales non perforatas, Laminas chrystallinas, Beryllinasq;: Chrysolitos, Rubinos deinde pretiosos: Carbunculos & alios rarissimos Lapidés Artificiales in Pulueres subtilissimos Conteramus. Denique quod cum ω notatum videtis, Vasculum est, Mysteriorum Plenisissimum: & ab ipsa Vltima Alphabeti Græci litera, (ad suam primam institutam Mystagogiam nunc restituta) vel sola partium manifesta Metathesi locali discrepās: ex duobus & illa quoque constante Semicirculis. De Vulgaribus præterea Necessarijs Vasorum, tum figuris, tum (vnde fieri debent) Materijs, non est necesse hoc loco, vt verba faciamus. Hoc tamen erit considerandū, ω, sui Muneris obeundi capere Occasionem, ex Secretissimo breuissimoque Spiraculi ARTIFICIO: Et (הכלה הברי ששם נשאר קרם) הכולה הברי ששם נשאר קרם (אין ממשל נמצא) Tyronibus OPERIS expeditissimum eliciet Primordiale Specimen: Interim dū SVTILIORA Præparandi, artificiosior illis innotescat Via. At in λ, vitreo (In præcipui sui officij functione;) Aër omnis externus, Ventusdā damnum adferret magnum.

ω, autem, OMNIUM est HORARVM HOMO,

Πόρμα.

Tis, ipas, Tis, Quisiam non potest suboderari, suauissimos & saluberrimos Fructus: vel ex istarum (dico) duarum tantum literarum enascentes Mystero? Quorum aliquos quasi in speculo videndos, propius aliquantulum ex nostris

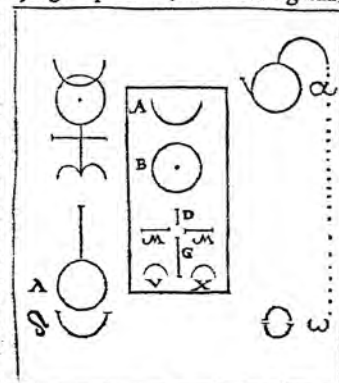
PLICITATIS PRIMAE. QVIS Ille Aequinoctialis no-ster. QVIS in causa fuit, quòd SOL EXALTARI poterat SVpra VVLGAREM SVVM GRADVM: Ceteraque priora, perplura, SECVNDIS SAPIENTIORISVS PERCVRRERE MEDITATIONIBVS. Sed nos ad alia nunc properantes, digito tantum alijs iter indicare, (cui insilire debeant) non amice solum, sed etiam fidelissimè volumus: Mysteriorum (vt diximus) aliorum tacentes tamen infinitatem Conspiciam.

## THEOR. XXII.

NONdum nostræ MONADIS esse exhausta Mysteria, facile liquebit. Si secretiora quedam ARTIS SANCTAE Vasa (omnino Cabalistica illa quidem) Solis Initiatibus Reuelanda, ex eiusdem MONADIS officina cautè desumpta, Vestræ Serenitati Regiæ, nunc exhiberem spectanda. OMNI ergo NEXV nostræ MONADIS Sapienter DISSOLVTO, singulis partibus (distinctionis gratia) literales addamus







Notas: prout hic factum videtis.

Monemus ergo, ω, esse Vas quoddā Artificiale, ex A & B: cum (vtriusque communi, & iam Manifestado SEMIDIAMETRO) ipsa quidem M, factum: Et, ab Alphabeti Græci, Prima, hac litera, sola partium locali Metathesi, diuersum:



F 2 vt Videtis:

nostris HESPERIDVM HORTIS) adducemus: Nihil, extra nostram MONADEM, in mediū ferentes. Ipsa enim quæ in Alpha apparet Recta Linea, omologa illi est, ex postremæ Anatomia, Crucis parte ea, quæ Litera M, notatur: reliqua etiam, inde patere potest, vnde huc veniant.

	Existens ante Elementa.	Adam Mortalis Masculus & Formina.	Mortificans.	Adumbrans.	Natus in Stabulo.
	Elementaris oconomia.	Elementalis Genealogie Consummatio.	Crux.	Crux.	Holocustum in Cruce.
	Existens post Elementa.	ADAM IMMORTALIS.	Vinificans.	Manifestissimus.	Rex Regum Ubique.
Conceptus Singulari Influentia.	Potentie Semen.	Creatio Hyles.	Matrimonium Terrestre.	Principium	
Passus & Sepulchus.	יהוה Virtus Denaria.	Depuratio Elementalis.	Crucis Martyriū.	Medium.	
Resurgens, propria virtute.	Glorie Triumphus.	Transformatio.	Matrimonium Diuinum.	Finis.	

His paucis, tales me scio non ἀπορίας solū, sed Apodixes dare illis, quibus Igneus intus viget gliscitque Vigor, & celestis Origo: vt facile iam magno Democrito aurem præbeant: τὸ τῆς Φυγῆς prædicenti ἰαμα; καὶ πᾶντος μὴ ὅς ἀνθρώπων καὶ ἀνθρώπων βυλομένων, non Μηδὲν esse hoc Dogma, sed

F 3 Μυστήριον.

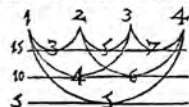






re, quis potest. Deinde de Earundem linearum QVATERNARIO: prout peculiarem, Myfticamque, alio modo, habet partitionem, & rationem. Tertiò, Numeris, quos vel isto loco, vel ex alijs, per totū libellum, Theorij, artificiose eliciūmus, vtilia quardam à Deo in NATVRA, eſſe deſtinata Officia, nonnullis monſtrabimus exemplis: aliaque opportunis inferemus locis: quæ fructum haud exiguum ferent, probè intellecta: hæcque breviffimè abſolueimus.

QVATERNARII PYTHAGORICI.



Omnis poſſibilis Metatheſis, 24.

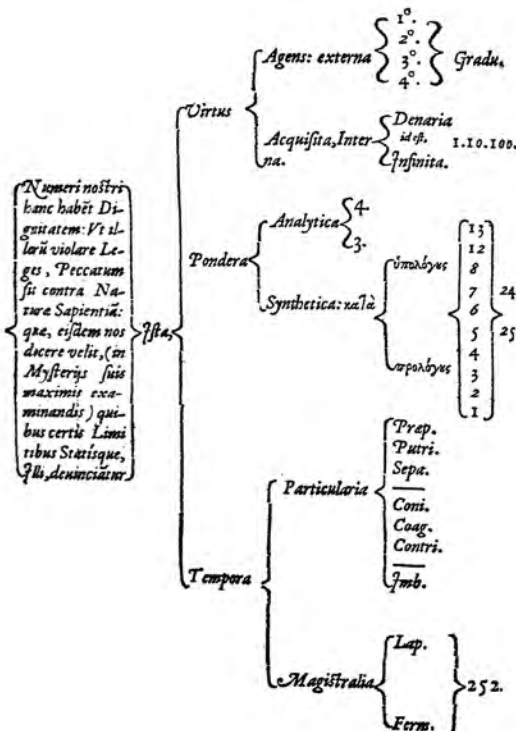
Summa Pythagorica, 10.

Omnimoda partium additio, dat 30.

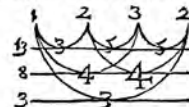
Noſter Metatheſeos Canon.

» NATURALI ordine, à Prima Monade, deſcriptis quocunq;  
» Numeris: Si à Primo ad Vltimum, fiat Continuata mul-  
» tiplicatio: vt, Primi in Secundum: producti in Tertium: il-  
» liuſque Producti in Quartum: ſimilique modo ad vltimū:  
» Productum vltimum, omnem Poſſibile Metatheſim in illis  
» tot locis, determinat. Parique ratione, in quibuſcunque, tot  
» diuerſis rebus: Hanc ego Operationem, tibi (O R E X)  
» plurimū Commendo: tum in omni Naturæ examinatione,  
» tum in alijs Reipub. Negotijs vtiliſſimā. hac ego in He-  
» bræorum Tziruph (ſiue Ihmura) cum maxima voluptate,  
» vti ſoleo.

QVA-



QVATERNARII ARTIFICIALIS.



Continuata multiplicatio, — dat — 12.

Simplex additio, — dat — 8.

Omnimoda partium additionis, Summa — est — 24.

Omnipotens Metatheſis Quaternaria, æquivalens Quatuor alijſque phyiſicis, 24. Karat, determinat Sanitatem, & Bonitatem Summam Supra terram dicitur haberi, per ſe.

NON sum Equidem Neſcius, per plures alios, ex QVATERNARII, Arithmetica Virtute, & FORMALITATE, in lucem adferri potuiſſe Numeros. Sed qui ISTIS, Naturæ evolui, illuſtrarique obſcuritatem uagnam, non deprehenderit: maiori eorum multitudine, obtundi ſuum, non acui, ſentiret ingenium. Noſtris ergo Numeris (vt ſumus polliciti) quantum in ſit Auctoritatis, in ELE-

MENTIS PONDERANDIS, in TEMPORVM MENSVRIS deſiniendis, Denique in Rerum Poſtati & Virtuti, certis præſcribendis GRADIBVS, ex ſequentibus, id perpendendum exhibemus Schematibus.

G 2 Numeri

Quaternarius  
Dignitas  
Dignitas

HORIZON AETERNITATIS.

8	7	6	5	4	3	2	1
4	3	2	1	8	7	6	5
4	3	2	1	8	7	6	5
4	3	2	1	8	7	6	5
4	3	2	1	8	7	6	5
4	3	2	1	8	7	6	5
4	3	2	1	8	7	6	5
4	3	2	1	8	7	6	5


QVATERNARIUS: quo Numero, MONAS noſtra ſabbatizatur: ARTIS NATVRÆ, QVÆ vltimam natã P. O. TESTATVM.

SILSIEPCE  
SVPERCE  
SVPERCE  
SVPERCE  
SVPERCE  
SVPERCE  
SVPERCE  
SVPERCE

EX iſtis Schematibus, plura elici poſſunt: (ſi penitus conſiderentur) quàm apertis par eſt proferre verbis. Hoc tamen præ ceteris monemus ſingulare vnum, (à nobis etiam Primis vnà cum tota hac noua euulgatum arte) Rationem hic in medio eſſe poſitam, ob quam, QVATERNARIUS, vel DENARIUS, Numerationibus ſinem imponit quandam: eamque cauſam quam attulere Maiores noſtri, non fuiſſe abſolutam, exactamque aſſerimus: ſed iſtam, quam nunc narrabimus.

Postquam iſta MONAS, eſt ſibi integrè, pleneque Phyſicèque Reſtituta, (tum quidem eſt MONAS, vnde iudicata VNITAS) neque in NATVRÆ, neque vilius ARTIS eſt poſſetate, EANDEM SÆPIVS QVAM QVATER, per Supercæleſtes Reuolutiones, ad Progreſſum vltimū, MOTVMVE faciendum impellere: (Ac inde progignitur ille,

G 3 quem

» quem nos, ob eminētiam suam, sic notari volumus,)   
 » Idque ea de causa, quod nec in Elementalī mundo,  
 » nec Caelesti, nec SUPERCAELESTI, sit aliqua  
 » Potestas, CREATA INFLUENTIALIS: Qua,  
 » tunc, non fuerit absolutissimè Ditata & Dotata.

Cuius, hunc verum Effectum, QVATVOR simul (olim)  
 Philosophantes Clarissimi Viri, Opere sunt consecuti: Vnde, diu, Maximo Rei Miraculo Attoniti, Tandem ad Dei  
 Opt. Max. Canendas, prædicandasque Laudes, se totos, deinceps conuertebant: Qui, ea ratione, illis, tantam Sapientiam, & super CREATURAS cæteras, Potentiam, Imperiumque fuisset Largitus amplissimum.

## THEOR. XXIII.

VT, nostrum huius Libelli Exordiū, à Puncto, Recta, Circuloque Cœpinus: Sicque ex nostro MONADICO PUNCTO, LINEAREM nostrorū ELEMENTORVM Effusionem Extremam, in Circulum Circumduximus,  
 1. Analogum ferè, ipsi Aequinoctiali, qui Horis 24, suā Conficit Circuitionem: ITA, nunc tandem, QVATERNARI OMNIMODAM METATHESIM; (Numero definitam,  
 2. 24.) METAMORPHOSIMQUE, hac nostra Vigesima QVARTA Consummabimus, Terminabimusque Theoria: Ad HONOREM, GLORIAMQUE eius: QVL (Teste, Mysteriorum Diuinorum Archipræsule, Ioanne: in QVARTI Apocalypseos Capitis, parte QVARTA, VLTIMAQUE) in Throno Sedit: In Cuius MEDIO CIRCVITVQUE, Animalia QVATVOR (singula ALAS SEX habentia) Sine requie, DIE ac NOCTE, dicunt: Sanctus, Sanctus, Sanctus Dominus Deus Omnipotens: QVI Erat: & QVI Est: & QVI venturus Est: QVEM  
 4. etiam, ex 24 Sedilibus, in CIRCVITV positis, SENIORES 24, procidentes (AUREIS SVIS ABIECTIS CORONIS)

CORONIS) adorant; dicentes: Dignus es Domine accipere GLORIAM & HONOREM, & VIRTUTEM: QVIA, TV, CREATI OMNIA:  
 Et propter VOLVNTATEM TVAM  
 SVNT: ET CREATA SVNT.

AMEN, DICIT  
 LITTEA QVARTA,  
 Δ:

*Cui, DEVS, Voluntatem Habilitatemque dedit, Diuinum hoc Mysterium, æternis Sic consignare Literarum Monumentis: Laboresque hosce SVOS, placidissimè absoluerè, Ianuarij 25: die eiusdem 13, Inchoatos:*

An. 1564. Antwerpia.



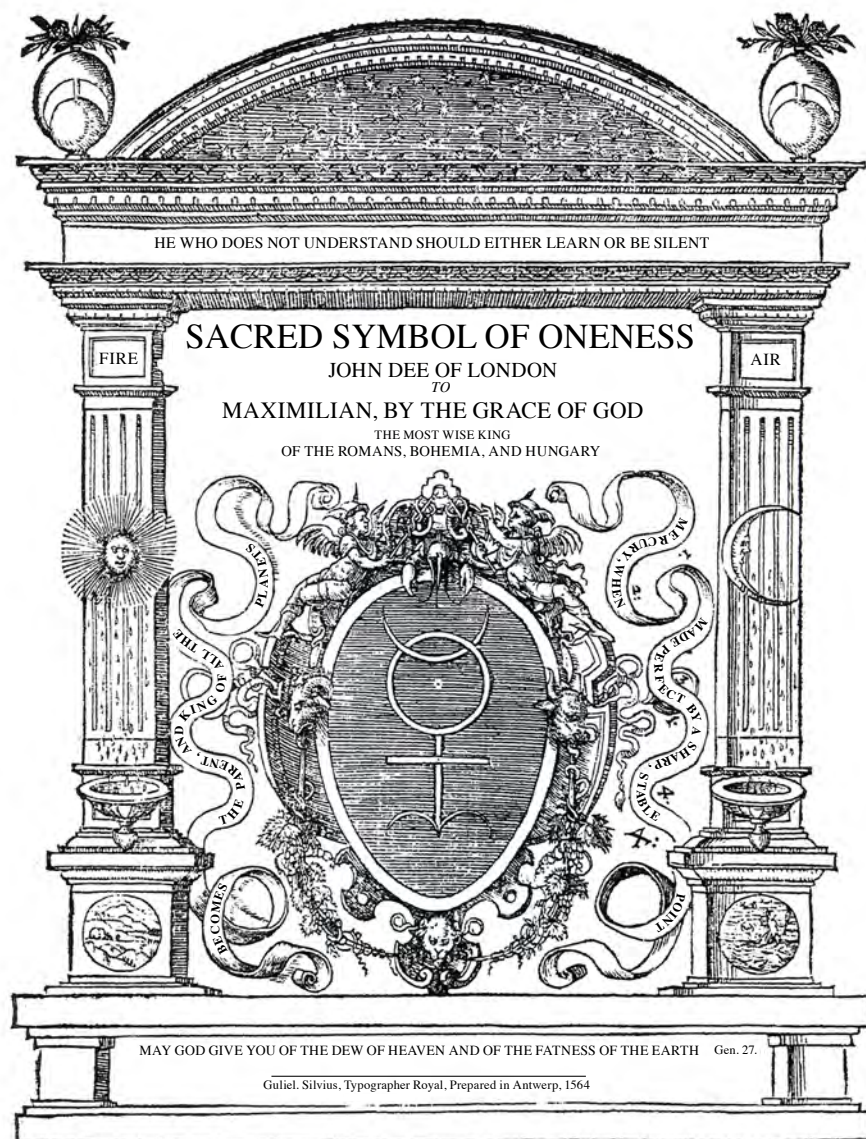
ANTVERPIAE:

EXCVDEBAT GVILLIELVVS SILVIVS, REGIVS TYPOGRAPHVS: FRIDIE CALEND. APRILIS. AN. 1564.









Translation by Jim Egan  
with guidance from translations done by  
Scott Barker in 2008,  
C.H. Josten in 1964,  
W.L. Hamilton-Jones in 1946,  
and Anonymous in 1691

#### NOTES ABOUT THIS TRANSLATION

1. The words written in a [small typesize and enclosed in brackets] indicate my clarifying comments and sometimes Dee's original Latin word.
2. All the parentheses (and the words they contain) are Dee's parentheses.
3. The words which Dee wrote in Greek have been highlighted with italics or in some cases with regular type.
4. The placement of marginalia follows Dee's original text (including the numerals and quotation marks that Dee used for emphasis) .
5. Previous translations have ignored Dee's many capitalizations. As they are expressions of emphasis, I have forrowed Dee's styling.
6. I have used Arabic numerals instead of Roman numerals make it easier to keep track of the 24 Theorems. However, the use of the word "Theorems" for Theorems 1-4, and "Theor." for Theorems 5-24, follows Dee's original styling (because its a clue).
7. I have included the 3 large decorative letters (Q, V, and P), which begin each of the three sections of the book because they are so graphic (and because they are clues). However, the "first letters" of each of the translated Theorems (also clues) are not necessarily the "first letters" of each of Dee's original Latin Theorems, so I did not capitalize them.
8. Dee used rather long sentences and paragraphs. For easier reading I have made shorter sentences, more frequent paragraphs, and have left space between the paragraphs.
9. Even though this English version is easier for most people to read, many "letter" and "word" clues in the text and illustrations are "lost in translation." Be sure to study the primary source, Dee's original Latin text, for these subtle clues.
10. To simplify, I have deleted the headers, the printer's pagination letters (at bottom of recto pages), and the "carry-over" words (at the very end of each page). I have kept Dee's page numbers and also added the corresponding "verso" page numbers ("opposite side"), so the pages can be referred to more easily.

This translation was done by Jim Egan, with assistance from Scott Barker.

© 2009 Jim Egan

It is based on original 1564 Latin text, but in addition, these three previous translations were consulted:

Anonymous, (1691), Ferguson collection MS 21, Glasgow University Library, Glasgow

J. W. Hamilton- Jones (1947), Red Wheel/Weiser, York Beach, ME (1975 and 2000),

C.H. Josten, (1964), AMBIX Vol. XII, No. 2 & 3, London

TO THE MOST EXCELLENT MAJESTY  
OF THE REKNOWNED KING  
**MAXIMILIAN**

JOHN DEE OF LONDON  
*Wishes a Very Fruitful Reign*



*The two causes which were able to encourage a Man of my Circumstances to present so small a gift to so great a KING have now impelled me to do so.*

*This gift is so extremely rare and of great goodness that the warm feelings I have for your Majesty should not be held in contempt, even though it is so small in size.*

*Your wondrous virtues have raised and procured an eternal Benevolence towards you. Your virtues are so great that even those who have not witnessed them in person believe, without a doubt, the extraordinary, yet quite true, reports of others.*

*Yet even those who have witnessed them in person and have carefully and keenly contemplated them, are still at a loss for words to fully describe the extent of these virtues.*

*As an eyewitness myself, I understand this very clearly, as I was in Posonium in your Kingdom of Hungaria last September [Dee attended his coronation as King of Hungary].*

*Allow me to speak about the Rarity of this Gift (small indeed in size) in as few words as possible. Using the full effort of my mind, I have concluded that the course of a Human life must be considered as two distinct parts (and most people live long enough to experience the second part).*



## 2 verso

*After Infancy and Puberty, the Adolescent is faced with a mind challenging choice: What type of life path to follow. After hesitating for a while, they must finally Decide between Two possible paths.*

*Some, (who have fallen in love with truth and virtue), for the rest of their lives, will devote all their energy to Philosophy. Others (ensnared by worldly allurements or burning with a desire for riches) work anxiously in many ways, in order to lead a luxurious life of profit and pleasure.*

*You can readily find a thousand examples of this type. Yet of the other type (that is, those who sincerely apply themselves to Philosophy), you can hardly find one who has even begun to examine the true foundations of Nature.* 1.

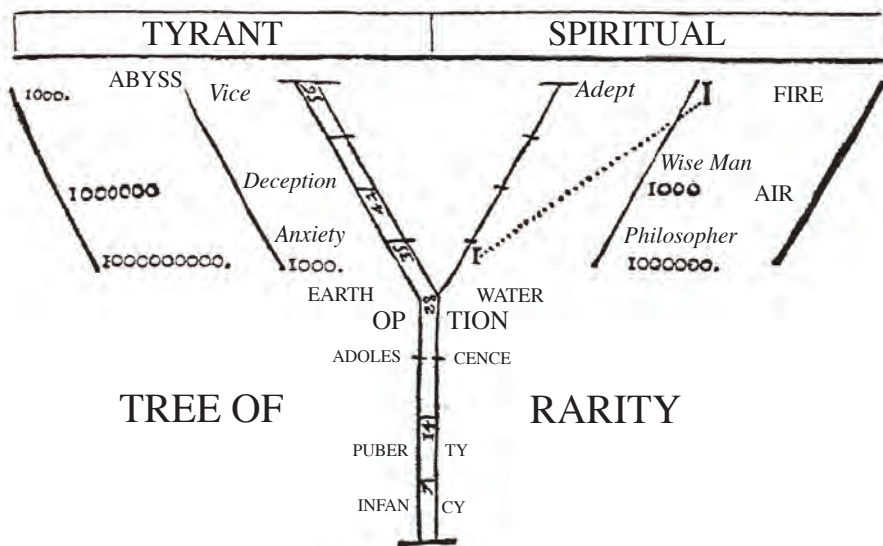
*Even of those scholars who have entirely devoted themselves to the study of wisdom, the Republic of Letters can hardly bring forth one of a Thousand who have searched deeply into the Causes of Celestial powers and Actions as well as the Beginnings, the middle States, and the Endings of Things.* 2.

*What should we then say of someone who, having surmounted all these challenges, further aspires to the investigation and understanding of Supercelestial virtues and Metaphysical influences?* 3.

*Where on the whole Orb of the Earth (and in these our sorry times) can such a Magnanimous and probably UNIQUE HERO be found?*

*Following our one-in-a-thousand Proportion (which was not rashly conceived), WE OUGHT TO EXPECT THAT THIS UNIQUE AND MOST FORTUITOUS SPECIMEN IS ONE-IN-A-MILLION AMONG PHILOSOPHERS, OR ONE-IN-A THOUSAND MILLION MEN OF THE COMMON SORT.*

*To demonstrate this RARITY, we present this HIEROGLYPHIC figure of a letter (called) Pythagorean. If your Excellency studies it with great attention, still greater Mysteries will present themselves (for your consideration), shown, in this way, from our COSMOPOLITICAL Theories.*



*Now, in what degree of this Three-level (Philosophical) Rarity I wish this my gift of mine to be, and to be esteemed, you (most Merciful KING), who excels and abounds in knowledge of the greatest Arts and most Secret Things, may easily conjecture.*

### 3 verso

*But even if I place it in the lowest and first degree of 1.  
Philosophizing, I think I shall not be acting in an arrogant  
manner. Raising our Heads higher above the ground, I can  
confidently Promise Your Highness even richer fruits than this  
Degree of EXCELLENCE.*

*My gift is endowed with a rareness because it is woven 2.  
together with a manner of writing, right up to the last thread,  
which up to this day, as far as I have heard or gathered from  
the written Monuments of our forefathers, no work has ever  
been composed.*

*Even though I call it Hieroglyphic, he who has exam- 3.  
ined it closely will confess that a sort of mathematical light  
and strength is exists in it, which is even rarer in such rare  
things.*

*Or is it not a Rare thing, I ask, that the Common As- 4.  
tronomical Symbols of the planets (instead of being Dead,  
or Dumb, or, up until now, Barbaric marks) are now imbued  
with Immortal Life, able to express their special meaning Elo-  
quently to those of every Language or Nationality.*

*Another great rareness has also been added, that is, 5.  
the external bodies [of the Astronomical Symbols] have now  
been brought back and restored to their Mystical Symmetries  
(by the best hieroglyphical arguments). It's as if, in an age  
long past, they were depicted like this or as if our forefathers  
had wished than in the future they would be made this way.*

*The new and successful way we have depicted the signs 6.  
of the twelve divisions of the ecliptic is as rare as it is com-  
pletely novel.*

*And indeed, the Rarest thing is that all this is embod- 7.  
ied in One Unique Hieroglyphic Symbol, that is, MERCURY  
(fortified by a Sharp Point).*



*Truly, Mercury is properly called the rebuilder and restorer of our whole Astronomy. He is the Messenger of our IEOVAE [Jehovah], sent so that we might be founders of a NEW discipline of this Sacred Art of Writing, or with this aid, renew one that was extinct and had been wholly wiped out of mankind's memory.*

*We have done this in a way that all these Hieroglyphical Interpretations show themselves most gently and of their own accord. Nothing is forced and nothing inappropriate, as it were, can be seen throughout this whole Little Book.*

8. *We seal those things we have just discussed (and things far greater yet to come) with our HERMETIC SEAL of LONDON declaring that there is not one superfluous point included and (even more significantly) that there is not one point missing. Everyone, especially those who profess to be serious investigators of philosophy and wisdom will be forced to authenticate the great Rarity of this work (for the everlasting memory of mankind).*

*Grammarians will have to Admit to this rarity when 1. they see that there are specific reasons for the shapes of Letters, their Positions or Places in the Order of the Alphabet, how they are Bound together, their Numerical Value, and many other things (that must be considered with regards to the Primary Alphabets of the Three Languages).*

*Furthermore, it is a Rare Grammarian who can Defend the idea that Grammar is ONE Science WHICH can be learned from ONE Man.*

#### 4 verso

*In my 1557  
narrative on  
the Englishman  
Roger Bacon  
entitled A  
Mirror of Unity.*

*Such a Man we have previously shown to be the Most Rare on Earth [that is, the one-in-a-thousand million Adept], when we wrote a Narrative about him. It appears to be that there are so many great Mysteries (of the Art of Grammar and things drawn forth about such Mysteries with the aid of the Art of Grammar) which have solid Foundations in the Sacred Scriptures of GOD ALMIGHTY, that even in a large Book I could not furnish all the explanations; nor indeed does that seem to be required Here.*

*Nor should you, O Glorious King of the Romans, be surprised that I mention in passing that Alphabetic Lettering contains such great Mysteries. For HE, who is the SOLE Author of all Mysteries, has compared HIMSELF to the first letter and the last Letter (which is to be understood not only in the Greek language, but also in Hebrew and Latin, as can be demonstrated in various ways in this Art). Oh how great, then, must be Mysteries of the Intermediate Letters? It is not surprising that such Mysteries are found in Letters, for all things visible and INVISIBLE, manifest or hidden (by either Nature or Art), emanating from God himself, are to be most diligently explored in our investigations, so we may proclaim and celebrate his GOODNESS, WISDOM, and POWER.*

*From  
Romans,  
Chapter 1  
[Paul writes  
about this  
lack of excuse  
in Verse 20.]*

*Thus Saint Paul taught that MANKIND would have no good excuse [for not proclaiming the Wisdom of God] even if it had no written testament other than his Creatures, which were made from GOD'S own finger during the CREATION. I would not be so demanding as to require these things of all Grammarians.*

*But to those who labor to find out the hidden Mysteries of things, witness that (by our MONAD) we have demonstrated a RARE Example[Exemplum] of this Kind.*

*We admonish them, as friends, that, the first Mystical letters of Hebrew, Greek, and Latin were issued by God alone and handed down to Mortals.*

*Furthermore, (despite what may be the custom of human arrogance to boast) the shapes of all those letters derive from points, straight lines, and circumferences of circles (by wonderful and most wise artfulness). The eternal wisdom of our Heavenly Father has taught us that the whole sense of the Mosaic Law [Laws of Moses] is to be considered, even to the fulfillment of every Jot and Tittle. The ultimate consideration and Analysis of these Laws is the IOD and Chireck (from which all the Hebrew letters and vowels arise).*

*Matthew,  
Chapter 5  
[refers to jot  
and tittle]*

ALTHOUGH THE ONENESS OF THE POINT OF A CHIRECK REMAINS MOTIONLESS AT THE APEX, *it is still not contrary of us to embrace a trinity of consubstantial monads, which appear to the ONENESS OF THE IOD ITSELF; THAT TRINITY BEING FORMED FROM ONE STRAIGHT LINE AND TWO DIFFERENT PARTS OF THE CIRCUMFERENCE.*

*The analysis reveals quite clearly that The First Humans could never have devised a work as Amazing as the Hebrew Letters and Nekudoth [vowel accent marks] without the Presence and Inspiration of Divine Power.*

*Even if these are the least of subjects, which are considered by Vulgar Grammarians, when the Wise properly consider how, and by what wonderful artfulness, they lend themselves to the generation of all the Letters and the Nekudoth, they will learn very many wondrous things (by perfect Spiritual Enlightenment).*



*Let us dismiss those Philosophers of Letters and Language and bring in my fellow MATHEMATICIANS honest Witnesses of the Rareness of this our Gift.*

2. *Will not the ARITHMETICIANS (and I don't say LOGICIAN) – who treats Numbers as Abstract Bodies, far from being perceived by the senses; who subjects them to various Mental Processes and hides them in the depths of Intellectual Reasoning – will he not be astonished to see, in this our Work, that his numbers are shown to be Concrete and Corporeal, and that their Souls and Lives as Forms are separated from them, so that they may be of service to us?*

*Will he not be surprised to see such wonderful Offspring of the MONAD, to which no Other Unit or Numbers need to be added, and which do not need to be Multiplied by any numbers they do not already contain?*

*Or by first contemplating Carefully Prepared operations of Division and Equation (as this Art prescribes)?*

*Will he not be filled with the greatest admiration by this most subtle, yet General Evaluating Rule: that the strength and intrinsic VALUE of the ONE THING, purported by others to be Chaos, is primarily explained (beyond any Arithmetical Doubt) by the Number TEN?*

3. *The GEOMETER (my King) will begin to feel embarrassed, and feel that the very Principles of his Art are insufficiently established (which is quite strange) when he understands what here is Secretly whispered and Intimated: By the SQUARE Mystery of this Hieroglyphic MONAD something CIRCULAR, and wholly Equal, is being conveyed.*

*Also that the TOILS of Archimedes may be compensated by a most excellent Reward, even though he never solved this Problem. In matters this Great, it is Enough to have had the Intention.*

*And won't the MUSICIAN be rightfully astonished 4.*  
*when here he will be able to perceive inexplicable, celestial*  
*HARMONIES without any motion or sound?*

*And won't the ASTRONOMER regret all his sleep- 5.*  
*less vigils and cold labors he has suffered under the Open*  
*Sky, when here, without any Discomfort from the Air, Under*  
*his own roof, with windows and Doors Shut on all sides, at*  
*any given Time, he is able to observe the movements of the*  
*heavenly bodies? And, indeed, without any Mechanical In-*  
*struments made from Wood or Brass?*

*And won't the OPTICIAN condemn the Senseless- 6.*  
*ness of his Ingenious work, laboring in all sorts of ways to*  
*make a Mirror according to a Line (appropriately curved in*  
*a circle) of a Parabolic Section of a Cone, which will attack*  
*any Matter (able to be burned by fire) with the incredible*  
*Heat from the Rays of the Sun. Yet here a Line is presented,*  
*resulting from a Three-Cornered Section of the Tetrahedron,*  
*from which, when Made Full-Circle, a Mirror may be found*  
*that (even when the Sun is being blocked by Clouds) can re-*  
*duce any kind of Stones or Metal into Impalpable Powders*  
*by the force of (truly the very strongest) Heat.*

*And will not he, who has devoted all the Time of his 7.*  
*life to making exacting measurements with WEIGHTS,*  
*judge just how well his Labors and costs have been invest-*  
*ed, when here, the Magistery of our MONAD will teach*  
*him, most assuredly by actual Experience, that the Element*  
*of Earth can float above that of Water?*

8. *Likewise, there are those who have diligently presented their findings regarding PLENUM, occupied by matter, and VOID, empty of matter, (a subject that has been controversial since Philosophy was in its Infancy). They have seen that the Surfaces of Elements, which are in close proximity are coordinated, connected, and Joined Together by a Law (decreed by God Almighty) and Bond (practically Unable to be Loosened) of Nature. They can most assuredly demonstrate to people that Fire, Air, and Water can be pulled or pushed, upwards or downwards, This Way or That Way (or in any direction they desire) in miraculous ways by various Inventions (which are useful to the Republic, as demonstrated by the Whole Art of Hydraulics and Heron's Feats of Magic [Thaumopoetica], as we nowadays like to call them.)*

„ *But no one of that Profession can claim to have made*  
 „ *a Machine, which could raise the Element of Earth Upwards,*  
 „ *through Water, and into Fire. However, the Theorems in our*  
 „ *MONAD demonstrate that this is possible.*

*O most wise King, may you Store these things in the most Secret Treasures of your Mind and Memory.*

9. *I now come to the Hebrew KABBALIST who will now see that Gematria [certain letters represent certain numbers] Notariacon [first letters of a phrase combine to spell a new word, similar to an acronym] and Tzyrurph [certain letters, jumbled, form different words] (the names of the 3 principal Keys to this Art) are used here, outside the confines of the Language, which is called Holy. Also, he will now see that the Symbols and Characters of that Mystical Tradition (which was received from God) entirely corroborated here (from the obvious, which is sometimes visible and sometimes invisible) then he will call this Art SACRED as well. Furthermore, (compelled by Truth, if he should understand) he will acknowledge, the same Most Benevolent GOD is not only the God of the Jews, but of all Peoples, Nations, and Languages,*



*regardless of boundaries, and that no Mortal may Excuse himself for his Ignorance of this our Holy Language.*

*In my Aphorisms delivered to the Parisians, I called this language the KABBALAH OF THE REAL, on the Kabbalah of Being. I call the other Kabbalah, the vulgar one, which utilizes well-known Letters, which are Written by Man The GRAMMATICAL Kabbalah or the Kabbalah of Saying.*

*The KABBALAH OF THE REAL, born to us by the Law of Creation, (as Saint Paul intimates) is more Divine, as it allows for the Discovery of New Arts and faithfully Explains even The most Difficult to understand Arts. Following our Example, others may see how it applies to other Arts.*

*I know well (O KING) that you will not be horrified 10. if I offer this MAGIC Parable in your Royal Presence. Our Hieroglyphic MONAS possesses, at its Innermost Center, a Terrestrial Body. The MONAS explains, without Words, how that Terrestrial Body is ACTUATED. When ACTUATED, the Terrestrial Body is UNITED (in a perpetual Marriage) to a Generative Influence, which is Lunar and Solar. Previous to this, in Heaven or elsewhere, the Lunar and Solar influences were QUITE SEPARATED from the Terrestrial Body.*

*When (by God's will) this Marriage has been made (which I interpreted for the Parisians as Tes games aîan, that is, the Earthly Marriage, the terrestrial image joining with influences from above), the Monad can no longer be nourished or watered on its Native Earth until the FOURTH great, and truly Metaphysical Revolution has been Completed. When this Advance has been made, he who nourished the MONAD will First Go Away into a METAMORPHOSIS, and afterwards, will very rarely be seen by the eyes of Mortals.*

7 verso

*This, O Great King, is the true INVISIBILITY of the MAGI, which has been sung about over and over again (and without Sin), and which (as all Future Magi will discover) has been granted to the Therems of our MONAD.*

- The most expert PHYSICIANS will most easily*
11. *learn from these same Theorems about Hippocrates' Mystical intent. For he will know WHAT IS TO BE ADDED OR TAKEN AWAY. He will Gladly acknowledge that this Same Art of Medicine is contained in the short Compendium of our MONAS.*
- Liber de  
Flatibus  
[meaning  
"Book of  
Breathing"]*

- The SCRYER ["BERYLLISTICVS" or crystal-ball gazer] may*
12. *see most accurately in a Crystal Lamin [thin plate used in scrying] all SUBLUNARY things that are of Earth or Water. And in a Carbuncle or Ruby he can explore the Region of Air and Fire.*

- And if the 21<sup>st</sup> Theorem of our Hieroglyphic*
13. *MONAD can satisfy a REFINER OF GOLD ["VOARCHAD-VMICO"] and give him ENLIGHTENMENT ["VOARH BETH ADVMOTH"] as a subject of speculation, he will admit that he need not travel to India or America for the sake of Philosophizing.*

- And finally, (using whatever ALCHEMY ["ARI-OTON"] can provide or promise, gleaned from 20 Years of hard work in The Hermetic Art), we have written on the subject of the ADEPT in a treatise to the Parisians, with*
14. *its own particular MONAD (illustrated with Conclusive Mystical Evidence). Nevertheless, we assure your Royal Majesty that with ALL THIS VERY evidence, so carefully presented, in this our Spiritual Hieroglyphic MONAD, that no other Similar Example could express it to mankind any better way.*
- Year  
1562*

*It must doubly turn into itself. Namely: to Assimilate the Dignified Work and to Imitate its Worthiness. You may now Agree, O King Maximilian, (famous for the Honor of his Three-fold Crown) that I have said enough (Indeed, I fear, more than enough if Vulgar men were listening) of the Rarity of this our Theoretical Gift, whose Quality is defined by its own limits.*

*It is enough (O to the singular Glory of all Kings) that While we have carefully demonstrated that this Gift is so rare, let No Aesopian bird (not even the most Envious Mischievous Tongue) mutter [disapprovingly] about it.*

*The most Modest and Wisest Philosophers will agree that this work is far from deserving the Indignity of False Accusations. For They will not disdain to provide, with me, Praise and Honor, to that Phoenix. From the Wings of its Lone Mercy, we have plucked, with both Fear and Love, all those extremely Rare Theoretical Feathers against our Nakedness brought on by Adam. May we much more Cheerfully resist all the sharp coldness of Ignorance, and hide the Shame of our Errors from the Philosopher's eyes, while striving for the honest TRUTH.*

*And although we have not, in Any Way, relied here on any human Authority, if something said or written by an Ancient Philosopher can be opportunely illustrated by our Light, then we have not refused to deliver this advantage to our Descendants.*

*In our Hieroglyphic Demonstrations we descend into certain Mysteries of Hermes, Ostanes, Pythagoras, Democritus and Anaxagoras, but not simply for the purpose of seeking confirmation of our own tenets in them.*



*This great Rarity is so well joined with such Excellent Quality that Nothing, WE PROTEST, has been placed by us in this little book, either openly or covertly, that is not Honest, Sincere, in accord with Human Dignity, and extremely Useful in the pursuit of perfect Piety and true Religion.*

*Such steep, difficult to reach Mysteries can only RIGHTLY<sup>[ORTHOTOMEIN]</sup> be judged by someone who sees their whole Amplitude.*

*For no one would betray his Childishness, Maliciousness, and Arrogance faster than he who would dare to Condemn as Impious, or Reject as frivolous, any of the things which we have Commended to Your Wisdom.*

*And in this regard, nobody could produce a witness that was Sharper in judgment, More Experienced in Practices, more powerful in authority, or more Faithful in Sincerity than the Greatest, Omnipotent King of Kings has made King MAXIMILIAN. Therefore, Your August Majesty will stand as a witness for me above all others.*

*The fact that our work has been Approved and Ratified <sup>[by your Majesty]</sup> will not only stop the mouths of many Wicked Grammaticasters but it will excite the minds of many Philosophers who are dejected, or Lying around Idly, by the Alleged Uncertainty of such great Mysteries. On account of the Rarity of such Things, they might be fearful of the Arrogant Judgments of the Ignorant – those who are wont to condemn Good Studies and Bad Studies alike (blindly and indiscriminately, as their usual names have a Resemblance), resulting in the most deplorable destruction (sometimes) of the Best of books.*

*It can clearly be seen that both <sup>[types of philosophers, the uncertain and the fearful]</sup> have, at various times, done great harm to the Christian Republic.*

*Their minds undoubtedly had the capacity to undertake such great matters, but they were completely terrified, for reasons previously mentioned; Or perhaps because Ignorant Judges had Rudely and Arrogantly condemned their whole study of such noble and divine Mysteries, they made only mediocre Progress.*

*But this is not the place to compare all the Honest Sciences with their false rivals, which are indeed Shadowy, Hateful, Troublesome, Harmful to Human Society.*

*Solely because of the way the vulgar grasp and follow [these false sciences], must, we say, be exploded and condemned, not only by the Judgment of the Vulgar, but by that of every wise man. And we urge that this be done diligently.*

*And those who do not even know these BODIES exist, or WHERE or what they may be, and of which [their false studies] are but weak shadows; How do they have the audacity; How can they justifiably condemn the non-Vulgar studies of the non-Vulgar man. LET JUSTICE BE DONE. Let each get his own due.*

*The Vulgar, who Pretend to have Knowledge [“sciolis,” sciolists], who not only eagerly pursue the Shadows of the Great Arts, but also defile them and lie about them in a most wicked way. We might attribute this to Foolishness, Delusion, and Lack of Respect.*

*To bring Violence against Virtuous and Firmly Grounded Studies of those who have strong moral character and Distinguished integrity (simply because of the petty, False Accusations of the Vulgar) not only brings their Names and their studies into disrepute, but also puts their Lives in danger. This (O King) seems to me not only inhuman, but Unjust and almost Sinful.*

## 9 verso

*All bodies have EDGES in COMMON with their Shadows (something which Mathematicians know quite well). Similarly the WISE realize that true Bodies [of work] have Dic-tion [word choices], in Speaking and Writing, which are in com-mon with their shadows. While the Wiser Philosophers enjoy the Solid Teachings and pleasant benefits of the BODIES, the Ignorant, Foolhardy and Presumptuous Apes Grasp at mere SHADOWS, which are empty and Worthless.*

*And so indeed we see This happen. All honest and legitimate Understanding and Comprehension of Shadows must be conceded to those dealing with true Bodies, but [to the vulgar, who hold things which are] not Solid and Sincere (merely vague shadows), such things will be snatched from their hands.*

*RIGHTFULLY [ORTHOTOMEIN], it is necessary (O King) to make a clear distinction between SHADOW and BODY in order to distinguish the Limits, Strengths, and Uses of each of them.*

*Luke,  
Chapter 8*

*[Luke, Chapter  
8, Verse 18 reads,  
"Take heed then  
how you hear;  
for to him who  
has, will more be  
given, and from  
him who has  
not, even what  
he thinks that he  
has, will be taken  
away."]*

*This Divine Duty, among many others, is performed with the Royal and Imperial sword of JUSTICE.*

*However, with a certain Artfulness, the Wise will gladly allow the figures of SHADOWS to exist in the sinuous curves of true Bodies, lest the choicest lettuces be offered to asses rudely rushing into the Hesperian Gardens, though thistles would be good enough for them. [What Dee seems to be saying is: Shadows can be quite valuable (like lettuce) and should not simply handed over to the vulgar (asses) when the vulgar would be content with much less (thistles).]*

*Forgive me (O King) if (by Christ's authority) I convict the World of Injustice. "And when He has come, He will convict the world of sin, and righteousness and of judgment."*

Josten points out that this is a reference to John 16:8. "And when He has come, He will convict the world of sin, and righteousness and of judgment." (New King James Version of the Bible, 1982)

Jerome's Latin Vulgate (405 AD) reads "et cum venerit ille arguet mundum de peccato et de iustitia et de iudicio." (Notice that the verb arguet (convict) is the same verb Dee uses.) (In the original Greek, the verb is elegcho, to reprove, accuse, or convict.)



*Nor do I wish that this work, which I have particularly commemorated to Your Wisdom, here and in these our times, to Appear to be mere opinion or as Superfluous. But enough of these things.*

*Thus, I most humbly Offer to Your Serene Majesty this my offspring, the HIEROGLYPHIC MONAD, (Conceived in London, yet Born in Antwerp). I earnestly desire, with all my strength, that you do not disdain to become its Second Father. Not only now, but later in life, when it will be older and even more Valuable because of your Trust, may it always be at hand and of service to you. I wish that henceforth you will consider it your own, O Most Merciful KING. During the entire period of its birth, your pleasing face seemed to be present before my eyes. In this respect, you have made my Labors fruitful and helped me bring this work to Light.*

*My Mind has been pregnant with it continuously for the past 7 years, yet because of the magnetic virtue you exert, even from such a great distance, it took me only 12 days to bring it forth, most peacefully, into the world.*

*May the Most Holy TRINITY grant that this be a happy and auspicious event in the life of your August Highness as well as to my most passionate searchings for honest truth. This Most Holy Trinity, (founded before all time, in the Omnipotence of the Ineffable MONAD), [“Ineffable MONAD” refers to the ONE whose name is not spoken, as in the Jewish tradition of not speaking the name of GOD.] which lives and reigns forever, and to whom alone all Praise, Honor, Power, and Glory always be given and sung by every Creature. AMEN.*

*As it appears  
in Aphorism 52  
of our  
Propaedeumatic  
Aphorisms,  
printed in  
London,  
in the year  
1558.*

*Antwerp.*

---

*In the year 1564, January 29.*

To the Printer  
**GULIELMO SILVIO:**

My exceptionally good Friend.

JOHN DEE OF LONDON

S. D. P.

[Offers his Wishes for much Health]



You See, my Good Friend Willem, how especially I esteem the most noble Virtues of the Illustrious King MAXIMILIAN, to whom I impart, from the Shrine of my Heart, my Rarest and most distinguished Secrets. I communicate these secrets so that Others in the Circle of the World can also enjoy them, thanks to your care and diligence. (This is done in honor of the King for his extraordinary and Regal Virtues. Thus, others may learn by his example, as he not only wisely attends to the Royal Governance of Kingdoms, but is still fully learned about the Wondrous Mysteries of Philosophers and Wise Men.)

There are, therefore, two things, which I earnestly ask of you. The first is that you carefully copy (as best you can) the Various Letters, Points, Lines, Diagrams, Shapes, Numbers, and other things.

This, the Same Body to which I have given birth, perfect in every part, (BY GOD'S WILL) will not be Mutilated or Deformed due to Printer's Negligence, as it is brought forth into the Light.

[The 1691 Anonymous author translates S.D.P as "Wisheth much Health." The 3 letters. might be an abbreviation of Salutare (Health or Prosperity), Desidero (to Wish), and Praebo (to Offer, Make, or Grant)] [Often the initials S.V.B.E. were used as a salutation for "si vales bene est." I hope you are in good health. –*Smith's English Latin Dictionary*, "health" p. 366]

In this way it will not be unworthy of a King, nor indeed unworthy of the studies and labors of the Philosophers who will frequently be examining it deep into its innermost parts.

I believe I have taken sufficient caution against that misfortune by selecting you as the Typographical Parent of this new Born child. I am certain you will take great Care to send it forth, in all ways, shining clearly, and with all of its Members Well-Composed.

The SECOND thing that I ask of you is indeed not a light matter. Make certain not to hand these Books indiscriminately to just any man. It is not that I begrudge them this, or anything better, but I suspect that bad things will result. These poor men may not be able to find their way through the Labyrinth (as they torture their minds in incredible ways while neglecting to take care of their everyday affairs).

Also, these men might persuade others to follow the same path (which will likewise be impassable). Even worse, impostors, who are but ghosts of men, may maliciously lie about its certainty, pretending that they had explored it fully. Finally, these men may boldly deny the existence of such MIGHTY WORKS OF GOD.

Based on their Presumptions, they will first rashly attack these Mysteries, then, in their Despair, they will furiously make false accusations about my Integrity.

[GULIELMO SILVIO is Latin for Willem (or William) Silvius (of the Forest).]



*11 verso*

Yet, having known you for many years, I know you will be cautious in such important business (either because of our friendship or for the Good of the Christian Commonwealth or, at least, for the Heroic Virtues of the Wise MAXIMILIAN Himself, virtues that are not found in the Common Sort of Men). I know I have not sought your Trust in Vain.

I know you will be cautious, and,  
because of you, all honest  
booksellers will be  
cautious as well.  
Farewell.

*From our Study in Antwerp*  
*In the year 1564, January 30.*

MONAS

# SACRED SYMBOL OF ONENESS

JOHN DEE OF LONDON

*Mathematically, Magically, Cabalistically, and Anagogically  
Explained To*

MAXIMILLIAN

Most Wise  
KING

of The Romans, Bohemia, and Hungary

## THEOREM 1

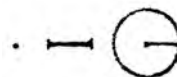


The very First and most Simple Representation, of not only existing things, but also things hidden in the Folds of Nature, and also in the exhibition of the Bringing Forth of Light, is made by means of a straight Line and a Circle.

## THEOREM 2

However, a Circle cannot be skillfully crafted without the Line. Likewise, the Line cannot be crafted without the Point.

Thus, Things come into being by way of the Point and a Monad. And things related to the circumference (regardless of how big they may be) cannot exist without the Service of the Central Point.



## THEOREM 3

Thus, the Central Conspicuous Point of the HIEROGLYPHIC MONAD refers to the EARTH, around which both the Sun, as well as the MOON, and the rest of the Planets complete their Courses.

And in this gift, since the Sun possesses the greatest dignity (because of its excellence) we represent It by a Complete Circle with a Visible Center.



**THEOREM 4**

The Semicircle of the Moon is shown here to be Above the Circle of the Sun. Nonetheless, the Moon obeys the SUN as her Master and King.

The Moon seems to rejoice in the Sun's Shape and proximity so much that she emulates him in the Size of her Radius (at least, as it appears to the common man). Finally she longs to be imbued by the SOLAR RAYS so much that she becomes Transformed into him. Then she disappears from the Sky altogether. After a few Days she reappears as a horned-shaped figure, exactly as we have depicted her.

**THEOR. 5**

And most certainly, one Day was Made out of Evening and Morning by the joining of the Lunar Half-Circle to its Solar complement.

Thus, it was on this first Day that the LIGHT of the Philosophers was made.

**THEOR. 6**

Here we see the SUN and the MOON resting on a Rectilinear Cross. By virtue of Hieroglyphic interpretation, this Cross is able to signify both the TERNARY and the QUATERNARY.

The TERNARY, as two straight lines and the one Copulative Point they have in Common.



The Quaternary, from 4 straight Lines forming 4 right Angles.

Each line might (for this purpose) be twice repeated. (Thus in this most secret way the Cross also shows itself to be OCTONARY. I doubt whether our Predecessors, the Magi, ever perceived it this way, but it should be especially noted.)

The magical TERNARY of the First of our Forefathers, and Wise Men consisted of BODY, SPIRIT, & SOUL. Thus we have here manifested the Most Excellent SEPTENARY: [made from] two Straight Lines with their Common Point [ a Ternary of things], AND 4 Straight Lines separated by One Point [a Quaternary of things].



**THEOR. 7**

An experimenter will learn that when homogenous Parts of the Elements have been removed from their natural Habitations, they will Return to them along Straight lines.

Thus, it is not Absurd to show the Mystery of the FOUR ELEMENTS by 4 straight lines emanating from a single Point in Different Directions (where they are each resolved into single Elements).

You will particularly note, Geometers teach that a LINE IS PRODUCED BY THE FLOWING OF A POINT. In the same way, our Lines signifying the Elements are like DROPS (like physical points) that continuously Fall (as if FLOWING) in our Mechanical Magic.

**THEOR. 8**

Furthermore, the Cabalistic Expansion of the QUATERNARY, using the customary Style of Enumeration (as we say, One, two, three, four) sums to the DENARY [TEN].

As Pythagoras himself used to say, 1, 2, 3, & 4 add up to ten. It is not without reason that the Oldest Latin Philosophers decided to signify the number TEN by using the Rectilinear CROSS made from 4 Straight lines (as it is the Twenty-First letter of the Roman Alphabet).

Its place might further be defined as being established when the TERNARY carries its power through the SEPTENARY.


**THEOR. 9**

All this agrees well with the SUN and MOON of our MONAD. By the Magic of the same 4 Elements, a Most Exact SEPARATION [SEPARATIO] has been made. Furthermore, the circumference lines of the circles, in the SOLAR compliment, form a CONJUNCTION [CONJUNCTIO] (for all lines of a given length will describe the same-sized circle, as per the laws of Geometry).

### *13 verso*

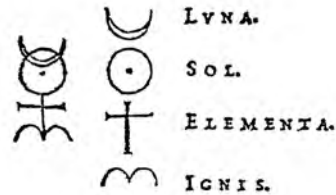
Thus, it is not possible to hide how much the DENARIAN symmetry of the Cross in our MONAD usefully serves the SUN and MOON.

#### ***THEOR. 10***

The (Sharp, Pointed) symbol of the Zodiacal Division of Aries, used by Astronomers  is quite well known to everyone.

It is also well known that this is the place in the heavens where the Fiery Triplicity Begins. Thus, we shall add the Astronomical sign of the Aries (in the Practice of this MONAD) to signify that the aid of fire is required.

We can summarize this hieroglyphical consideration of our MONAD in our hieroglyphical statement:



THE ELEMENTS OF THE SUN AND MOON OF THIS MONAD, IN WHICH THE DENARIAN SYMMETRY IS STRONG, WANT TO BE SEPARATED, AND THIS IS DONE WITH THE AID OF FIRE.

#### ***THEOR. 11***

The Mystical Sign of Aries, consisting of two Half-Circles joined together at a common Point, is most fittingly signified by the Equinoctial Nycthemera [the place of the sun on the Spring Equinox, the first day of Aries].

The Time of Twenty-four Hours, divided in Equinoctial mode, denotes our most Secret Proportions. I say this in respect to the Earth.

[Equinoctial mode means using with hours of equal length, not hours of unequal length, a system used before 1200 AD.]

#### ***THEOR. 12***

The most Ancient Wise Magi have handed down to us the Hieroglyphic Symbols of the five Planets. Indeed, they are composed of the characters of the MOON and the SUN, and from the hieroglyphic symbols of the Elements and of Aries. As shown here, it is not difficult to explain their shapes Hieroglyphically from the foundations we have previously laid down.

First, we shall speak, in Paraphrase, of those planets, which have Lunar Characteristics, then of the ones with Solar characteristics.

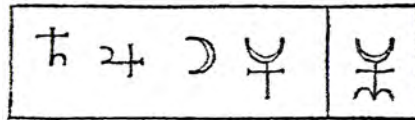
♄		Saturnus.	♂	♂	Mars.
♃	♃	Jupiter.	♂		Venus.
☿		Mercurius.	♂		Mercurius.

When our LUNAR Nature first revolved around the Earth by the science of the Elements, it was mystically called SATURN. Later [during its second revolution], for the same reason, it was called JUPITER and retained that more secret shape. [rotated clockwise, see chart above].

And, in a more obscure way, they [the oldest wise men] represented the Moon, in the third revolution, with the elements applied. They used to call it MERCURY. You can see how LUNARY it looks [the Lunar Mercury Symbol]. Some of the Wise Men preferred to envision Mercury as being made in the FOURTH Revolution. This will not Contradict our Secret analogy.



Only the Purest Magical Spirit can manage the Work of the *al-bification* [tês leuxanseos] in the place of the Moon. By his Spiritual virtue, he may, when ALONE with us in the Middle of a Natural day, speak to us hieroglyphically, without words. He will introduce those 4 Geogamic [Earthly] figures and IMPRESS them into the very Pure and Simple Earth prepared by us. Or, instead, that other symbol [the Lunar Mercury Planets Symbol, on the far right].



### THEOR. 13

Don't the Hieroglyphs of the SUN and of ARIES combine to make the Mystical Symbol of MARS? Doesn't the Magistracy of the elements (partially) intervene? And, I ask, don't the SUN and the Fully expressed Elements make the sign of VENUS?

Therefore, these two Planets have consideration for the SOLAR *circumference* [periroran] and to the work of *revivification* [Anazoopyreseos] by fire.

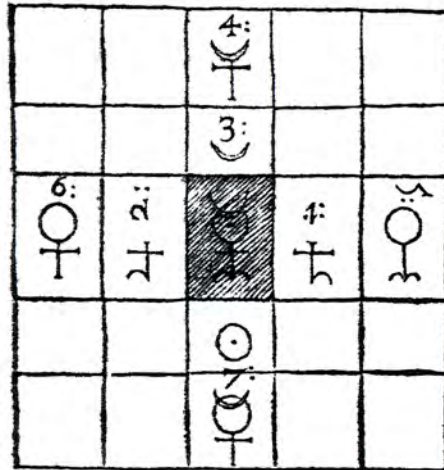


# 14 verso

In this progression Appears another Mercury, who indeed is the Uterine Brother of the first. This is clearly the fully complete Lunar and Solar Magic of the Elements, as the Hieroglyphic Messenger tells us most expressly, if only we fix our eyes upon him and lend him an attentive ear. He is (GOD WILLING) that most Famous Mercury of the Philosophers, the MICROCOSM and ADAM

Yet some Great Experts put the SUN itself in his place and degree. In our present age, we are not able to demonstrate this unless we let this *Golden Work* [*Khrysoxarallino*] be governed by the SOUL that has been Separated from the BODY by the Art of Fire. This work is difficult and dangerous because of the Fires and Sulphorous fumes.

THE PRINCIPAL  
ANATOMY  
OF THE MONAD  
IN THE WHOLE  
[ART OF]  
INFERIOR  
ASTRONOMY



But, surely that marvelous SOUL will show forth, binding VENUS [LUCIFERUM] and even MARS [PYROENTA] to the disc of the MOON (or at least that of MERCURY) with unbreakable bonds.

In the third place (as some will have it) is the SUN of the PHILOSOPHERS (to

Complete our SEPTENARY Number). You can see the exactitude and the clarity with which the ANATOMY of our HIEROGLYPHIC MONAD corresponds with the ARCANA of these two Theorems.

## THEOR. 14

Now it is clearly confirmed that this whole Magistry depends upon the SUN and the MOON. Of this, even the Thrice-Great Hermes admonished us, asserting its Father is the SUN and its Mother the MOON.

And we know it is to be nourished in LEMNIAN EARTH. Without a doubt, LUNAR and SOLAR rays exert a singular INFLEUNCE upon it.

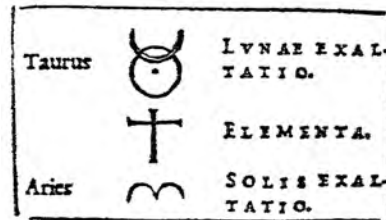
### THEOR. 15

We suggest that the Philosophers should consider the Labors of the SUN and the MOON around the Earth. While the SUN's Radiance is exalted in Aries, the MOON Receives a new Dignity of Light in the Next Sign (namely Taurus) and is EXALTED above its own innate powers. The ancients explained the Proximity of these LUMINARIES (more notably than others) by the mystical Symbol of TAURUS. 1.

That Taurus is the EXALTATION of the MOON is common knowledge, which has been handed down from the first age of the Man (among the Maxims of the Astronomers). This Mystery can only be Understood by those who have become complete Masters of the Mysteries. For a similar reason, they have said that TAURUS is in the HOUSE of VENUS [VENERIS esse DOMVM], of Chaste and Prolific CONJUGAL LOVE.

As that Great OSTANES concealed in his most Secret Mysteries, "For Nature delights in Nature [ê physis,te physei têrpetai]."

But the SUN, having suffered some Eclipses of its light, receives MARTIAN Strength and is said to be Triumphant in its EXALTATION in the same HOUSE [DOMO] (namely, in Our Aries). These Secret Mysteries are clearly and perfectly shown in our MONAS. 2.



Depicted here is the Hieroglyphical Sign of Taurus and also that of MARS, which we explained in Theorems 12 and 13 has a straight line going from the SUN to ARIES.

### **15 verso**

From the present Theorem, another Cabalistic anatomy of our MONAD presents itself, of which this is a true and skillful description: KNOWLEDGE OF THE ELEMENTS, WHICH ARE IN THE MIDDLE BETWEEN THE EXALTATION OF THE MOON AND THE SUN.

#### **NOTE**

*In my Opinion, there are two things that should be particularly noted here. First, that the Hieroglyphic Symbol of Taurus also represents to us the Diphthong of the Greeks, which is always the singular Genitive Ending of the first Declension. Secondly, by way of Simple Transposition, the letter ALPHA is demonstrated in two ways: either with the Circle and Half Circle Tangent or (as shown here) intersecting.*

#### **THEOR. 16**

We must now briefly Philosophize on our assertions about this noble CROSS. Though our CROSS has been made, as we have said, from two straight lines of equal length, they do not divide each other into equal lengths.

In the Mystical distribution of our Cross, we wanted equal parts and unequal parts. However, hidden in the power of these Two lines divided this way is also the virtue of an Equilateral CROSS (because the two lines are of equal Length).

Generally speaking, a certain JUSTICE of NATURE demands that when a CROSS is made from two lines of equal Length, they should be divided Crosswise equally. In accordance with this Justice, we shall propose the following ideas about the Equilateral Cross (which is just like the twenty-first letter of the Latin Alphabet.)

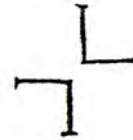
On this Rectilinear, Rectangular and Equilateral CROSS, when any Straight dividing line goes through the point of intersection separating Oppositely placed angles, the parts on each side of the dividing line are similar and equal. The resulting parts are the same shape as the letter that the Latins accepted as their FIFTH vowel, and was commonly used among the most Ancient Latin Philosophers to denote QUINARIUM [the number 5].

And I think that it was not done by them Irrationally, as it Conforms to the Middle of our DENARIUM [the number 10]. Each of these two parts (from this Hypothetical division of the Cross) represents the number FIVE [Roman Numeral V], one of which is upright, and the Other is upside-down.



This reminds us of a Multiplication, which is the Squaring of Square Roots (which here falls wonderfully on a CIRCULAR NUMBER, the number FIVE). Most certainly this produces TWENTY-FIVE (and it [the letter V] is both the twentieth letter and the fifth vowel).

We shall now consider another orientation of the equilateral CROSS which is similar to our MONADIC CROSS. If a similar Division of the Cross into two halves is made, (as above), the twin symbols of another Letter of the Latin Alphabet is revealed. One of them is upright, and the other is upside-down and backwards. This letter (from the ancient custom of the Latins) has been used to represent FIFTY.



It seems to me that this sign was established first, because the sign for FIVE was essentially derived from the sign for TEN of Our Cross, and from a Place where that Cross, the Greatest of all Mysteries, is the most Consummate Hieroglyphical Sign. Thus, EMBRACING the Strength of TEN and the virtue of FIVE, it rejoices, and brings forth the NUMBER FIFTY.

O, MY GOD, HOW GREAT ARE THESE MYSTERIES?

Furthermore, the Name of that Letter, EL [letter L], seems to respect the Denarian virtue of the Cross as it has been placed in the Middle Position between the first Letter of the Alphabet and the letter which makes the Denarian Cross, being Tenth in sequence from either letter [L is halfway between A and X].

And since we have shown that there are two such integral parts of the CROSS (considering now their numerical meaning) it's apparent that the CENTARIUM is produced [the number 100].



### *16 verso*

But if, by the Law of Squares they [the two letter L's or the two 50's] are multiplied by each other, our result is Two-Thousand-Five-Hundred.

If this SQUARE NUMBER [2500] is divided by the previously mentioned Square of the first Circular Number [5 times 5, or 25] it will bring us back to the CENTENARIUM [2500 ÷ 25 = 100]. Thus, the CROSS, explaining itself by its DENARIAN Strength, will be perceived as referring to CENTURIO [the number 100].

Therefore we are now taught (besides other things worthy of being noted) by these Theories of the CROSS to enumerate and proceed in this manner: One, Ten, Hundred. We are carried upwards by the DENARIAN Symmetry of the CROSS. Nevertheless, as the Character of the CROSS is unique, it also represents One.

### *THEOR. 17*

As it is apparent from Theorem 6, there are FOUR right angles in our CROSS. The preceding Theorem teaches how to attribute to each of them a QUINARIAN significance, the right angles being still arranged the same way, but having a different Position [X as opposed to +].

The same theorem shows how the Hieroglyphic Symbols of the Number FIFTY are made [Roman numeral L].

Also it is quite evident that, vulgarly, the CROSS signifies the number TEN. This is also the twenty-first letter in the sequence of the Latin Alphabet (whence it came to pass that the Wise Men called Mecubalists [ones versed in Jewish tradition] used to signify twenty-one by the same letter).

Finally, the Cross may be considered in a most simple way, as it is seen to be One Symbol, whatever other virtue and whatever degree of strength it has.

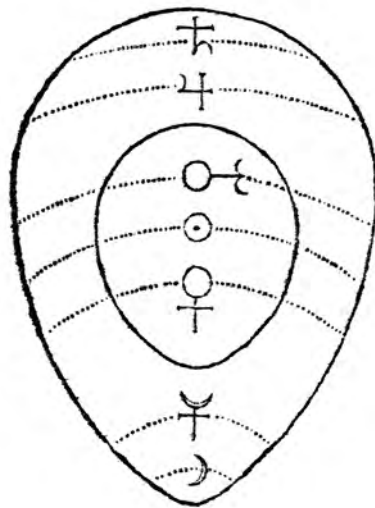
From all this it may be concluded, by the best Cabalistic Description that our CROSS is able to signify, to the Mystics, in a Wonderfully Abbreviated way, TWO HUNDRED AND FIFTY TWO [number 252]. As FOUR times FIVE; FOUR times FIFTY; TEN, TWENTY-ONE, AND ONE makes TWO HUNDRED AND FIFTY TWO.

There are two other logical ways that we can draw forth this Number from our premises. For the sake of brevity, we recommend these reasons be rooted out by Beginning Kabbalists. The various artificial productions of this Magistral Number are also worthy of the Consideration of Philosophers.

I shall not conceal from you here another Memorable Secret Mystery. We have Seen that our Cross has allowed itself to be Divided into two other letters. As previously we dealt with their Numerical virtue in a certain way, now we shall compare their VERBAL FORCE with the CROSS, because then a LIGHT [LUX] will appear. We shall understand with the highest admiration the Final and Magisterial WORD (through the Harmony and Agreement of the TERNARY in the Unity of the Word).

### *THEOR. 18*

From our twelfth and thirteenth Theorems it may be gathered that Celestial Astronomy is like a parent and master to INFERIOR [Astronomy].



Therefore, our Cabalistic eyes being lifted towards Heaven (illustrated by the Theories of these Aforementioned Mysteries) we shall behold an ANATOMY exactly corresponding to that of our MONAD, showing itself to us in the LIGHT AND LIFE OF NATURE.

For it reveals, by its own WILL, the Secret Mysteries of this Physical ANALYSIS.

*17 verso*

As we were contemplating both the Theoretical and the Heavenly motions of that Celestial MESSENGER [Mercury], we were taught that the figure of an EGG might be applied to these COORDINATIONS.

For it is well-known to Astronomers that he makes an OVAL-shaped Circuit on his course through the Aether.

And since a word to the wise is sufficient, behold our Interpretations of this Celestial Advisor (shown hieroglyphically), which completely agree with what we have previously said. HENCE, let the Pitiful Alchemists be admonished to acknowledge their various Errors.

What is the WATER of the White of EGGS?

What is the OIL from the YOLKS?

And what is the SHELL of the EGG?

May these Ignorant Impostors, in their Desperation, come to understand these things and many more things like them: HERE WE HAVE PRACTICALLY ALL OF NATURE'S SYMMETRY.

Once upon a time, a SCARAB [dung-beetle] shattered an EAGLE'S EGG because of the INJUSTICE, the violence and cruelty, which that BIRD had inflicted on Men and Timid Beasts. Some took refuge in the Scarab's Cave (seeking help), but still they did not have their freedom.

The Scarab determined that he alone, in any way possible, must avenge that INJUSTICE. He had a spirited mind, was prepared with a firm determination, and lacked neither Strength nor Ingenuity. The Scarab made several efforts to persecute the EAGLE Using the most Subtle Art of DUNG.

At last, he caused the EGG (which had been deposited in the Lap of Jupiter) to FALL DOWN TO EARTH and be BROKEN INTO PIECES.

Using this and other methods, the Scarab would have obliterated all of Eagle-kind from Earth, had not Jupiter (on the Alert for such an evil) ordered that no SCARABS shall fly about at the time of year when EAGLES care for their EGGS.

I would counsel those who are bothered by the Cruelty of the BIRD to learn a most Useful art from those Sunbeetles (who live by lying hidden for certain courses of time).

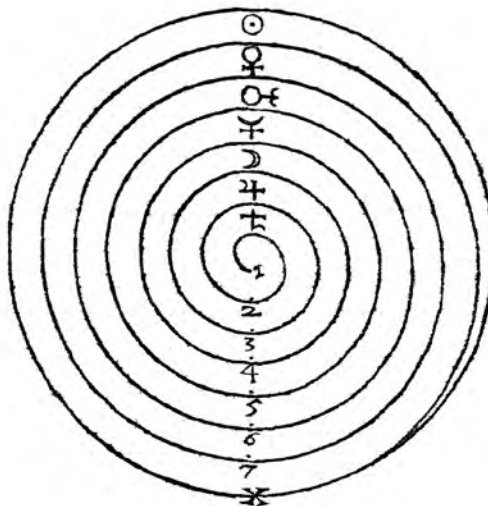
Even if they themselves do not act, it is still most acceptable if, from the EVIDENCE and Signs, Revenge can be taken on the Enemy.

If those men, to whose minds it first came to telling fables concerning the highest Mysteries of Nature, were present, they would confess (O KING) that I am not trying to play Aesop, But Oedipus.

I know for sure that there are some who, if they had the EAGLE'S EGG DISSOLVED, by the SCARAB'S ARTFILLNESS, would first COMBINE [TEMPERAMENTUM] its SHELL with the entire, pure white of the EGG. Then they would smear that compound with all the liquid of the YOLK, in a skillful way, rolling, and rolling some more, just as the Scarabs conglomerate their Balls.

Thus, a great METAMORPHOSIS OF THE EGG would occur. Indeed, the WHITE, (by those multiple, as it were, Spiral Revolutions), would certainly disappear as it involutes with the LIQUID OF THE YOLK.

By this Artifice, such a Hieroglyphical sign will not displease the Stewards of NATURE. We read that such an Artifice was much celebrated in prior centuries, by the most venerable and most Ancient Philosophers, as most certain and most useful.



Later, Anaxogoras made his most excellent Medicine from this Teaching, as seen in his little book, *The nature of whirling around fast*. [peri ton ekstrophon physikon]



*18 verso*

He who sincerely applies his mind to these Mysteries will clearly see that nothing here is outside of the virtue of the Hieroglyphical MONAD.

**THEOR. 19**

The PYRONOMIC ANALYSIS [ANALYSIS BY FIRE] of all Corporeal things demonstrates effectively that the SUN and MOON infuse their Corporeal strengths, into all Inferior Elemental Bodies in a much stronger manner than do all the other Planets.

The MOON pours out Watery Moisture [Aqueous Humor]. The SUN pours out Fiery Liquid [Igneum Liquorem]. Thus the TERRESTRIAL CORPULENCE [of the fat of the Earth] of all mortal things is sustained.

**THEOR. 20**

Previously we demonstrated, by good Hieroglyphical reasoning, that the ELEMENTS are signified by Straight Lines. Here, we shall provide an Accurate Observation about the POINT which is at the CENTER of our CROSS. As in our Examination of the TERNARY, that [point] can in no way be Regarded as Absent from [that central] location in our BINARY. Some (Unskilled in Divine Mathematics) might Contend that it was Absent. If it was absent, then our BINARY world not Remain, but a QUATERNARY would emerge. Taking away that point, would create a Discontinuity of the uniformity of the Lines.

Yet our Adversary had Supposed with us that a Binary would Remain. By this argument, the BINARY and the QUATERNARY would be one the same, a thing which is Manifestly impossible [*ton adunation*]. That POINT must Necessarily be there, as, along with the BINARY, it Constitutes our TERNARY. Nothing else can be SUBSTITUTED in its place.

Nonetheless, it is not of the Essence [Hypostatic Property] of the BINARY, nor in any other way a Part of it. That it is not a Part can be clearly explained this way: All Parts of a Line are Lines. Yet the hypothesis affirms that this is a POINT.

Therefore, it is not any part of the BINARY, never mind its being of the Essence of the Binary. Thus it should be particularly NOTED that it even though it is contained in the LINEAR Lengths of the BINARY, it has a ESSENCE of its own.

And since, in this way it is seen to be COMMON TO BOTH, it can be thought of as RETAINING A SECRET IMAGE OF THE BINARY.

Thus, we clearly DEMONSTRATE: THE QUATERNARY RESTS IN THE TERNARY.

I beseech you, my God, to forgive me, if I have Sinned against your Majesty by Revealing so great a Secret in Public Writings. But, I Hope Only Those who are Worthy will Understand.

Let us now proceed to that QUATERNARY, which we have assigned to our CROSS. Let us discuss whether that POINT contained THEREIN can be absent.

Mathematics surely teaches us that it can be removed.

IF THERE IS A SEPARATION, not only does our QUATERNARY RESULT, but it becomes much more DISTINCT and made CLEARER for everyone to see.

NO PART OF THE SYMMETRY OF ITS SUBSTANCE HAS GONE AWAY. THIS SUPERFLUOUS AND CONFUSING POINT IS THUS UNCOVERED, BUT CONDEMNED.

O Almighty and Divine Majesty, WE MORTALS ARE FORCED TO ADMIT WHAT GREAT WISDOM AND INFINITY OF UNSPEAKABLE MYSTERIES ARE CONTAINED IN THY TITTLES AND JOTS, AS REPRESENTED IN THE ORDERLY ARRANGEMENT OF THY LAW.

CAN THE GREATEST SECRETS AND ARCANA OF THE EARTH BE EXPLAINED AND FAITHFULLY DEMONSTRATED, BY VARIOUS EVIDENCE, SOLELY BY THAT ONE POINT WHICH I (BY THY LIGHT) HAVE LOCATED AND EXAMINED?

*19 verso*

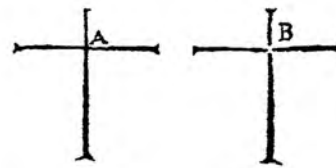
This POINT, seen clearly in the divine TERNARY, is by no means SUPERFLUOUS there. But, when the POINT is in the REALM OF THE FOUR ELEMENTS, it is considered FECULENT [containing feces or dregs], indeed CORRUPTIBLE and FULL OF DARKNESS. O Three, Four Times Blessed are Those Who are able to ATTAIN that (as it were, COPULATIVE) POINT of the TERNARY, and who can leave its GLOOM and SUPERFLUOUSNESS to the Prince of Darkness.

” Thus we shall reach a CLARITY [as white as] SNOW and the distin-  
” guished WHITE GARMENTS.  
”

O MAXIMILIAN (with you or some future member of your Austrian Family as The Teacher of these Mysteries), Whom God, to the Honor of His Tremendous Name, will make the Greatest in times to come (while I am Sleeping in Christ) in that abominable, even intolerable Darkness (of the Point, which is SUPERFLUOUS ON EARTH). But, lest I Myself should offer Superfluous words (that are not in their due place), I will presently bring myself within the Limits of my purpose.

Now, since I have finished my Discourse to those whose eyes are Seated in their Hearts, I must turn my Speech to those whose Hearts still extend from their eyes. The figure of the CROSS, illustrated here, is able to represent the things we have previously spoken about.

First, in figure A, the POINT is NECESSARY in the TWO LINES of Equal Length (intersected equally or unequally).



Then, in figure B, (where there is a certain Emptiness where the superfluous Point has been removed) you can distinctly see FOUR straight Lines which, without suffering any change, have been SEPARATED from the POINT they previously had in common. This is the way in which Our MONAD, progressing by way of the Binary  
” and TERNARY, is restored to its OWN Oneness in a Purified QUATERNARY  
” by the Proportion of Equality (for every Whole is Equal to all its parts).  
”

During this process, our MONAD does not admit any External Units or Numbers. It is perfectly self-sufficient, being complete in all its numbers.

It is diffused in Magical ways into the grand Abundance [of Numbers]. Eventually, by the uncommon, Skillful Work of a Master and by the greatest Profit of the Monad itself, in Dignity and Strength), it is Restored to its First and Own MATTER. Meanwhile, the Impurities which have no Respect for its genuine and hereditary Proportion, have, by all means and diligence, been cut off and cast away forever.

### *THEOR. 21*

Earlier you have seen the Philosophical Translation of the MONAD made when that which Lies Inwardly Enclosed in the Recesses of our MONAD was brought to Light. Its First Parts or, as it were, Outer Parts changed Places and Became Enclosed in the Middle place.

[Dee seems to be referring to how the planetary symbols formed the central Monas symbol in the "Anatomy of the Monad" diagram of Theorem 13]

Now we will show you another transposition of the Mystical MONAD. When our Hieroglyphical Characters of the SUPERIOR PLANETS earlier showed themselves to us, they were Upright.

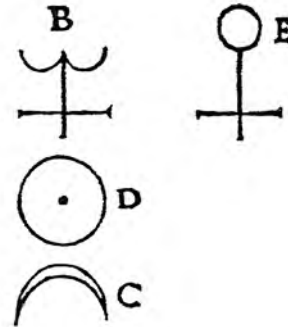
When they are changed in another way, these Planets will be in the Order which Plato ascribes to them. Saturn, Jupiter, and Mars come together where the Point of Aries is. Then descending, the Cross serves [to help form the symbols of] Venus and Mercury. Finally, there follows the Sun itself and, at the bottom, the MOON. But these matters should be dealt with in another place.



However, I did not wish to conceal these Philosophical Treasures of our MONAD, so I have decided to give one reason we considered it meaningful to change the Position of the MONAD in this manner. Concerning this Position, you shall See and Hear greater things, to be explained in a few words.



Let us therefore Divide the Monad (positioned in this new way) into its anatomical parts B, D, and C. In that new TERNARY are parts D and C, signs that we have previously become acquainted with [Moon and Sun], but here they appear somewhat uncouth. The THIRD one, marked B, might not be as easily recognizable to everyone, but it should not be considered lightly.



1. Those well-known FORMS, D and C, denote ESSENCES which are separate and different from B.
2. Secondly, the horns of C are seen turned downward, as it were, towards the EARTH.
3. And that D, in whose center alone is that POINT to be seen which is truly TERRESTRIAL, illuminates C, and looks towards the earth, namely downwards.
4. And finally, that both D and C here direct their Hieroglyphic message towards lower places than does B.

The earth, however, may Hieroglyphically denote to us STABILITY and FIXATION. What, therefore, D and C are, I leave to inference. Everyone can hereby learn a Great SECRET. What we previously said about the SUN and the MOON when the lunar Horns were elevated upwards, may now be interpreted in a fuller and most necessary way. But enough of these matters.

Now we will examine the NATURE of that THIRD symbol [labeled B] in Accordance with the Principles of our Hieroglyphic Art. First, it seems to carry on its Head a DOUBLE MOON, our Aries sign (only Mystically inverted). Then, appended to it, is the Hieroglyphical Sign of the Elements.

How great this Duplicate MOON is, (according to the subject Matter) can be explained by the GRADES OF THE DOUBLE MOON. We speak of those degrees, which Experts in Natural Science can find but FOUR among all created NATURE, namely, TO BE, TO LIVE, TO FEEL AND TO UNDERSTAND. Noting that the First Two of these Grades are in this [inverted Aries sign or “double-moon”] we shall thus say:

THE MOON EXISTS AND IS ALIVE.

Some define Life by MOTION, and there are Six well-known kinds of movement [up, down, left, right, front, back, as per Plato in the Timaeus].

The adjoining CROSS denotes that the Distinguished Artifice of the Elements is required here. Moreover, we have frequently said in our Theorems, the HALF-CIRCLE is the hieroglyph of the MOON, and the Whole-Circle signifies the SUN.

But now, there are two Half-circles, which are SEPARATE (though Connected by a common POINT). If they are appropriately joined (as indeed they may be by art) they are able to represent the Circular fullness of the SUN. Taking all these considerations together, we might Hieroglyphically Summarize with this maxim:

THE MOON, EXISTING AND ALIVE, WITH THE TREATMENT OF THE MAGISTRY OF THE ELEMENTS, HAS THE POWER TO REPRESENT THE FULLNESS OF THE SUN, WHEN ITS TWO HALF-CIRCLES ARE JOINED TOGETHER BY ART.

We show that completed CIRCLE (which we just mentioned) noted here letter E [in the illustration]. First, let us remember that this SOLAR GRADE did not, by NATURE, lie in our way, but has been MADE UP ARTIFICIALLY.

Indeed, in its first appearance it presented itself to us in its Nature (as can be easily seen in B) with its Parts Loose, Flowing, and unconnected, not yet Compacted SOLIDLY into a Solar Appearance.

[in B, the outer tips are unconnected, but in E they are connected]

Let us next remember that the Radius of these Half-Circles is not equal to the Radius of D and C (which were produced for us naturally and are Well-Known to all), but are much smaller. Thus it is clear that B is not of such great magnitude as D and C.

And E confirms this for us very well, as by the operation of [closing] the Circle, B was advanced to the shape of E. Thus, before our eyes appears nothing more than the sign of VENUS.

## 21 verso

Therefore, we have already made it plain by those Hieroglyphic Syllogisms: We may not hope for the true D to be [produced] out of B.

[a syllogism is an argument with two premises and a conclusion]

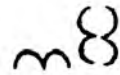
Nor was there, at first, a true C in the nature of B, and therefore no TRUE, live MOON. Thus, concerning LIFE and Motion, you might be doubting that [a relationship] really exists between them in Nature.

However, as we have already made clear to the wise, ALL THINGS that we have said (about B) in metaphorical phrasing are ad minus ANALOGIES. Also, that which we briefly touched upon regarding C and D applies ANALOGICALLY quite fittingly to B and its ELEMENTS.

Furthermore, what we have said about the Nature of Aries must apply to B, because it carries Aries (though inverted) on its head. That Mystical Sign of the Elements is also joined to B. From this Anatomy of the singular body of the MONAD (thus dissected by art) we see that a new TERNARY has come forth.

Thus we can have no doubt that the MEMBERS, thus Formed, embrace each other closely in a mutual SYMPATHY. They allow, as if by their own accord, a MOST ABSOLUTE MONADIC UNION whose MEMBERS have a strong MAGNETIC virtue.

Finally, we are pleased to note (for the sake of the recreation of the mind) that B most readily presents us with as many RUSTIC letters as it has pointed ends on its Head or, as it were, on its Forehead.



The three clearly illustrated here, are very ROUGH and in want of neatness, yet fluid and rolling. While, in a different way, there are six, (which Summed together make three times three). As you see, they are made from one or more Half-Circles.

Yet in the hands of Experts on the writing of letters [grammarians or literati], there is a stronger, more Enduring Reason for the SHAPING OF THOSE LETTERS. Here I have had before my eyes an infinity of Mysteries, but I wanted to interrupt the Theorizing with this Sport.

Yet, (After restoring our MONAD to its former Mystical Position, Skillfully Compositing its several Members) I understand that I will promote the Efforts of some if I At Least advise them and exhort them to NOW accurately learn WHAT the FIRST TRIPPLICITY, the FIRE of ARIES, is. WHAT that Equinoctial is. WHAT caused the SUN to be EXALTED and capable of being RAISED ABOVE ITS ORDINARY GRADE.

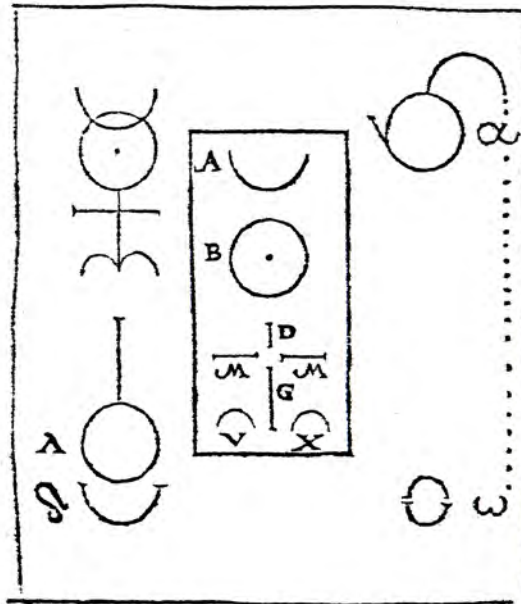
And to RUN OVER, IN SECOND AND WISER MEDITATIONS the many things we have previously stated. As we hasten on to other things, we thought it fit to point out to others on the road (on which they should press on) not in only in a friendly way, but also most faithfully, though keeping silent (as we have said) on the CONSPICUOUS infinity of other Mysteries.

### THEOR. 22

It's clear that the Mysteries of our MONAD have not yet been exhausted. Now I will show Your Serene Royal Highness more secret Vessels of the HOLY ART (indeed, entirely Kabbalistic ones) carefully chosen from the workshop of the MONAD, and which provide revelations only to Initiates. Therefore, with All of the Connections of our MONAD Wisely DISSOLVED, let us add letters to the various parts (for the sake of distinction), just as you see Marked here.

We point out that  $\alpha$  [the lower-case Greek letter alpha] is a certain Artificial Vessel made from A and B, with M (the RADIUS common to both, only now made Evident). As you can see, it differs from the First letter of the Greek Alphabet by only a slight Transposition [Metathesis] of its parts.

We are the first to teach that its True and Mystical Proportion consists of a Straight Line, a Circle and a Half-Circle. Although it can also be made from just a Circle and Half-Circle, as we have shown previously. [in the NOTE at the end of Theorem 15]





## 22 verso

Nevertheless, all these ways fall within one and the same Mystical design.

But  $\lambda$  &  $\delta$  are, at least Primarily, like images of other implements (indeed,  $\lambda$  is VITREOUS [made of glass], but,  $\delta$  is an Earthen one [made of clay, earthenware, stone, etc] [  $\lambda$  and  $\delta$  are the lowercase Greek letters lamda and delta, which, in uppercase, are  $\Lambda$  and  $\Delta$  ].

And secondly,  $\lambda$  and  $\delta$  may remind us of a certain Pestle and Mortar, which have to be made from a material (truly) that with them we can Pulverize into fine Powders, Artificial Pearls without drilled perforations, Plates of crystal or Beryl, Chrysolites and precious Rubies, also Carbuncles and other Most Rare Artificial Stones.

Lastly, that which you see marked  $\omega$  is a small vessel which is Full of Mysteries. The vessel differs from the very last letter of the Greek Alphabet (now restored to its originally established Mystagogic [pertaining to mysteries] meaning) by a slight, but obvious, transposition of its parts, which are two half-circles.

It is not Necessary to further discuss the shape of these common Vessels nor the Materials (from which they should be made). Yet it should be noted that  $\alpha$  [lower case Greek letter alpha] is waiting for an opportunity to perform its role, by a short, but very Secret ARTIFICIAL air-vent.

And  $\text{אן אחר ממצעל נמצא (חמלא חמירי ששב ושרח קרב)}$  *litroVinium* ] it will draw forth a Primordial Specimen most useful to Beginners of this WORK until a more skillful Way of Preparing SUBTLE [substances] becomes known to them. But any external Air or Wind would do much damage in  $\lambda$ , the glass [vessel], (in the performance of its principal function).







$\omega$ , however, is a MAN of ALL HOURS.

[lowercase Greek omega]

### *Corollary [Porisma]*

Who cannot detect the scent of those sweet and healthful Fruits of *The Holy Art* [*Tes ieras Texnes*] that arises (I declare) from the Mystery of just these two letters? We shall bring some of these [fruits] (from our HESPERIAN GARDEN) a little closer, to be seen as if in a mirror.

Yet we still will not be bringing forth anything but our MONAD. For the Straight Line appearing in Alpha is homologous to the part marked by the Letter M in the most recent Anatomy of the Cross. From this the rest of the chart becomes accesible.

	Existing before the Elements.	Mortal Adam Male and Female.	Mortification.	Wrapped in Shadow.	Born in a Stable.
	Ordering of the Elements.	Consummation of the Elemental Geneology.	Cross.	Cross.	Sacrificed on the Cross
	Existing after the Elements.	ADAM IMMORTALIS.	Vivification.	Manifestation.	King of Kings Everywhere.
Conceived by his Own Influence.	Powerful Seed.	The Creation of Matter.	Earthly Marriage.	Beginning.	
Suffering and Burial.	YHWH Virtue of the Denary.	Purification of the Elements.	Martyrdom on the Cross.	Middle.	
Rising again by his own Virtue.	Glorious and Triumphant	Transformation.	Divine Marriage.	End.	

With these few [words in the chart], I know I am providing not only starting points [*arormas*], but Conclusive Proofs [*Apodixes*] to those in whom inwardly there blazes a fiery Vigor and a heavenly Origin. May they readily lend an ear to the great Democritus, announcing to those who *wish a remedy for their spirit and who, by all means, crave a deliverance from their hard labors*, that this Doctrine is not *Mythical* [*Mythakon*], but *Mystical* [*Mystikon*] and Secret.

[to tes psykes...iama kai pantos moxthou lutêrion kataskseusasai boulomenois]

### 23 verso

As also [they should listen] to he who has asserted that it is the *method established by the speech of the maker of the world, that the religious man, born of God, by right-working, may learn by these words, which are theological and mystical.*

[lôgo demiourgou (demiurge) xosmou (cosmos) metho denetai: ina o theophron xai o thegenes anthropos, dia tês rutheias ergasias: xai theologixon, xai mustixon logos mathe]

#### THEOR. 23

We now present the proportions, accurately notated, observed by us in the Hieroglyphical Construction of the MONAD, to be observed by those wishing to bear it on Rings and Seals, or to use it in other ways.

In the Name of JESUS CHRIST who was for us affixed to the CROSS (the pen only of Whose Spirit, writing these things swiftly through me, I Desire and I Hope to be), we shall now endeavor to obtain all these Measurements from our ELEMENTS of our CROSS.

We do this because (in accordance with the SUBJECT MATTER of our INTENDED ARGUMENT) everything that takes the Beginning of its Generation under the Celestial MOON is either composed of the FOUR Elements or is itself on Elementary ESSENCE. And that [is possible] in various ways that are not Commonly Known.

And since these Elements are not in Equal Proportion or strength in any Created thing, yet (as the Wise know) can in certain things be reduced to Equality by Art, we have made our CROSS from equal and unequal parts.

Thus, in another regard, we may call them the Same and the Different, or the One and the Many, while (as we pointed out above) Secretly admitting the qualities Peculiar to the equilateral CROSS.

But, if we were to clearly point out the causes or divulge all the reasons (which we hold fast) for the PROPORTIONS shown here, more than the ones we have explained (to the wise) throughout the whole book, we would be passing beyond our limits, which were not prescribed without intent.

Choose any Point in a plane, for example A. Draw a line through it at sufficient length on both sides. Make this C,A,K. At Point A, on the line KC, erect a Perpendicular.

Extend it to a sufficient Length (in Infinitum, as the Geometers say, and rightly so, to avoid inconveniences). Let this line be DAE. Now, choose a Point anywhere on line AK and let it be B.

Thus, having first of all established AB (which is the common Measure of our work) project its triple [length] from A towards C. This line shall be AC.

Make AE Twice the Length of AB. Also, make AD Twice the Length of AB. Thus, the whole DE is Four Times the length of AB.

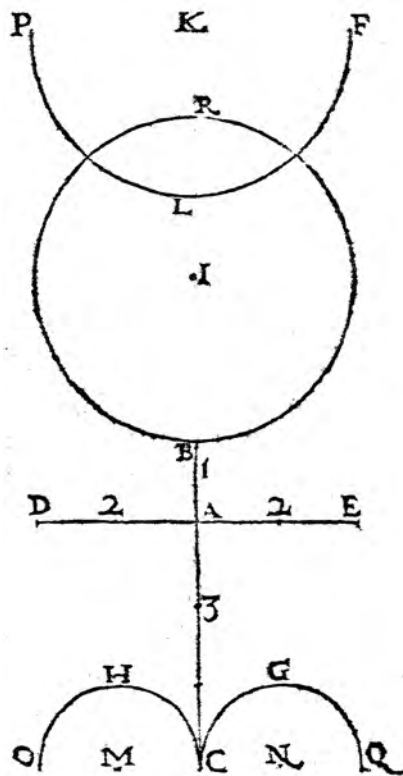
In this way, we have made our CROSS OF THE ELEMENTS from a QUATERNARY of lines: AB, AC, AD, and AE.

Let a straight line of length AD be cut out of the BK and call it BI. With a Centerpoint at I, and a Radius of IB, describe a Circle. The Circle cuts line AK at R, so the diameter of the circle is BK.

Let a straight line of length AB be drawn from point R towards K, and let it be RK. Then, let a straight line of sufficient length be drawn extending out from both sides points K (at right angles to AK) which shall be line PKF.

Let a straight line of length AD be projected from point K toward F and let it be line KF. With a centerpoint at K and radius KF describe a half-circle FLP, whose diameter is FKP.

Finally, let a perpendicular to the straight line AC be drawn through point C. It should extend to sufficient length on either side and be called OCQ.





## 24 verso

Then, on line CO and from point C, make a straight line of length AB, which shall be CM. With a center point at M and radius MC, describe a half-circle CHO whose diameter is CMO. Likewise, a line of length AB shall be made along CQ and from point C, and this line shall be CN. With a centerpoint N and radius NC, describe half-circle CGQ, whose diameter is CNQ.

We now affirm that all the required PROPORTIONS of our MONAD have been explained and described.

We should point out to the Mechanicum that the whole line CK consists of nine equal parts, each the length of our FUNDAMENTAL AB. Thus, he may go about performing this work in another way.

Also, all Diameters and Radii ought to be marked with (as the Mecanici say) invisible lines. Nor should any CENTERS remain visible, except for the Solar Center, which is seen here marked with the letter I. Furthermore, no more letters are to be added.

Now, for the sake of Ornament (there are no Mystical requirements considered by us now) the Mechanicus can add a certain Surface Width to the Solar Circumference (by drawing one concentric circle inside of it). (The distance between the two concentric circles should be approximately one fifth to one quarter of AB [the length of that “common Measure”]).

The Moon is to be a fully horn-shaped, the way she appears in the Sky after her first Conjunction with the Sun. To do this, measure up from point K, towards point R, a fourth or fifth (as we have mentioned) of the length of line AB. Using this as a Center, and line AB, which is in fact the Radius of the Moon, draw a second partial-Circumference, which will contact and rest on both sides of the previously drawn Half-Circle.

A similar thing can be done at points M and N. Erect Perpendiculars at these points and measure upwards one sixth the length of AB, or even less. With these new points as centers and the previously used radii MC and NC, draw second half-circles, as it were, on the outside.

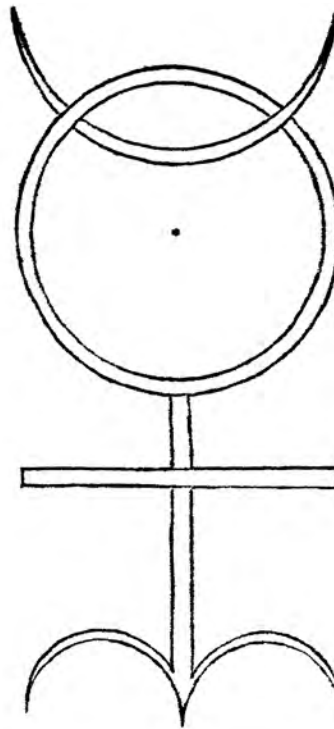
[A “Mechanicum” is a skilled workman without the knowledge of Mathematical demonstration – Dee’s definition from the *Preface to Euclid*]

[“invisible” is a translation of Dee’s Latin word *obscuris*, meaning “dark”, which poetically means “invisible,” as objects become invisible in the darkness.]

Finally, on both sides of the Straight Lines of our Cross, drawn parallel lines at a distance of about one tenth to one eighth of that length AB.

Thus, our CROSS is made from FOUR, as it were, Linear Surfaces whose width is about one fifth to one quarter of length AB.

In this adjoining illustration, I have sketched in outline one way that this Ornamentation might be done. One may arrange all [these widths] however he sees fit, as long as no harm (not even the slightest) is done to our Mystical PROPORTIONS.



By such negligence, the new Discipline of these true (and essential) Hieroglyphic Measurements may, in the course of time, be thrown into confusion or even perish.

It [this "new Discipline"] is by far more splendid and Grand than we have been able, or indeed, even wanted, to explain in this little book. TRUTH, the Daughter of Time, will teach this, GOD WILLING.

We will now Methodically place a few more things before your eyes, which may be obvious to anyone becoming practiced in the Symmetries of our MONAD. Let's begin with the QUATERNARY of Lines in the Cross.

Some are in the habit of declaring that these lines are, in essence, FOUR. But, this QUATERNARY of lines, rightfully, is capable of a different Mystical partitioning and calculation.

[To summarize these "secondary" circles and half circles:

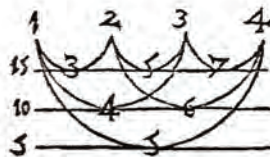
- (1) A circle is drawn inside the Solar Circle.
- (2) A half-circle is drawn above the Lunar Crescent.
- (3) Two half circles are drawn above the two horns of Aries.]

## 25 verso

Thirdly, we will point out several examples of Numbers, which are used by God in NATURE, that we have skillfully derived from it [the Cross] or from other Theories throughout the book.

[Fourthly] We shall blend in others [other numbers], in appropriate places, which, if understood correctly, will bear not a little fruit. All this we shall do concisely.

### PYTHAGOREAN QUARTERNARY



All possible  
Trans-  
positions **24.**

The  
Pythagorean  
Sum **10.**

A Complete  
addition of  
the parts,  
yields **30.**

### *Our Canon of Transposition*

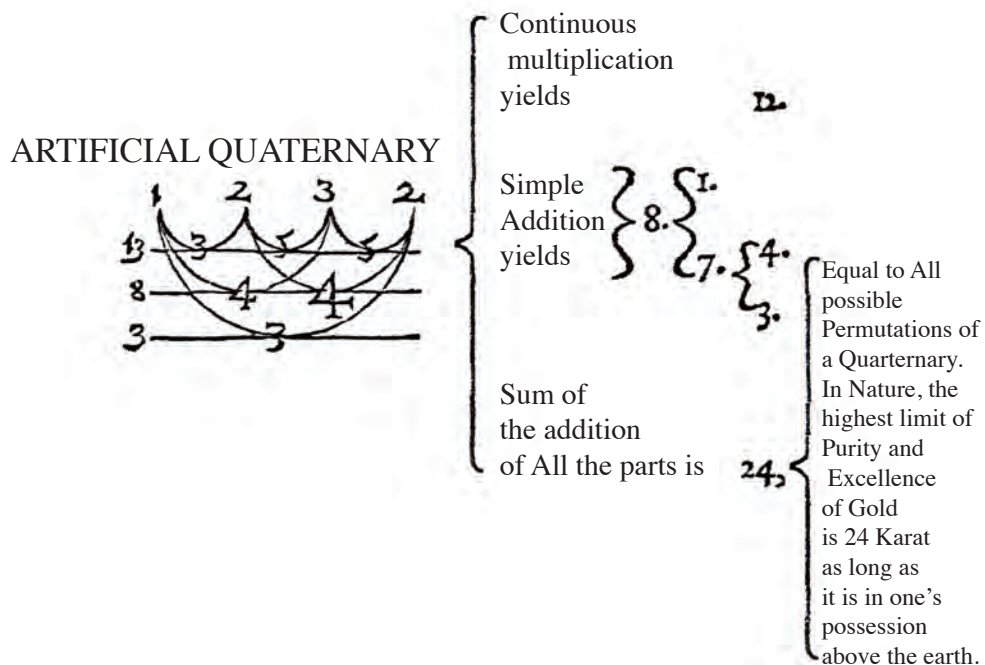
” However many Numbers are chosen to describe, make a Continuous multiplication from the First to the Last, starting from the First  
” Monad and proceeding with the Natural sequence.

” In other words, multiply the First times the second, then that Product by the Third, then that Product by the Fourth, continuing to your  
” last number.

” The final product is the number of Possible Permutations in so many places [or how many ways in which the chosen number of digits can be re-arranged].

” This same procedure of computation can be used anywhere and  
” for so many diverse things. I highly Recommend this Operation to you (O KING) as the one most useful in every investigation of Nature and also in the Affairs of the Republic. I am in the habit of using it with the greatest of satisfaction in the Tziruph (or Thmura) of the Hebrews.

QUA-

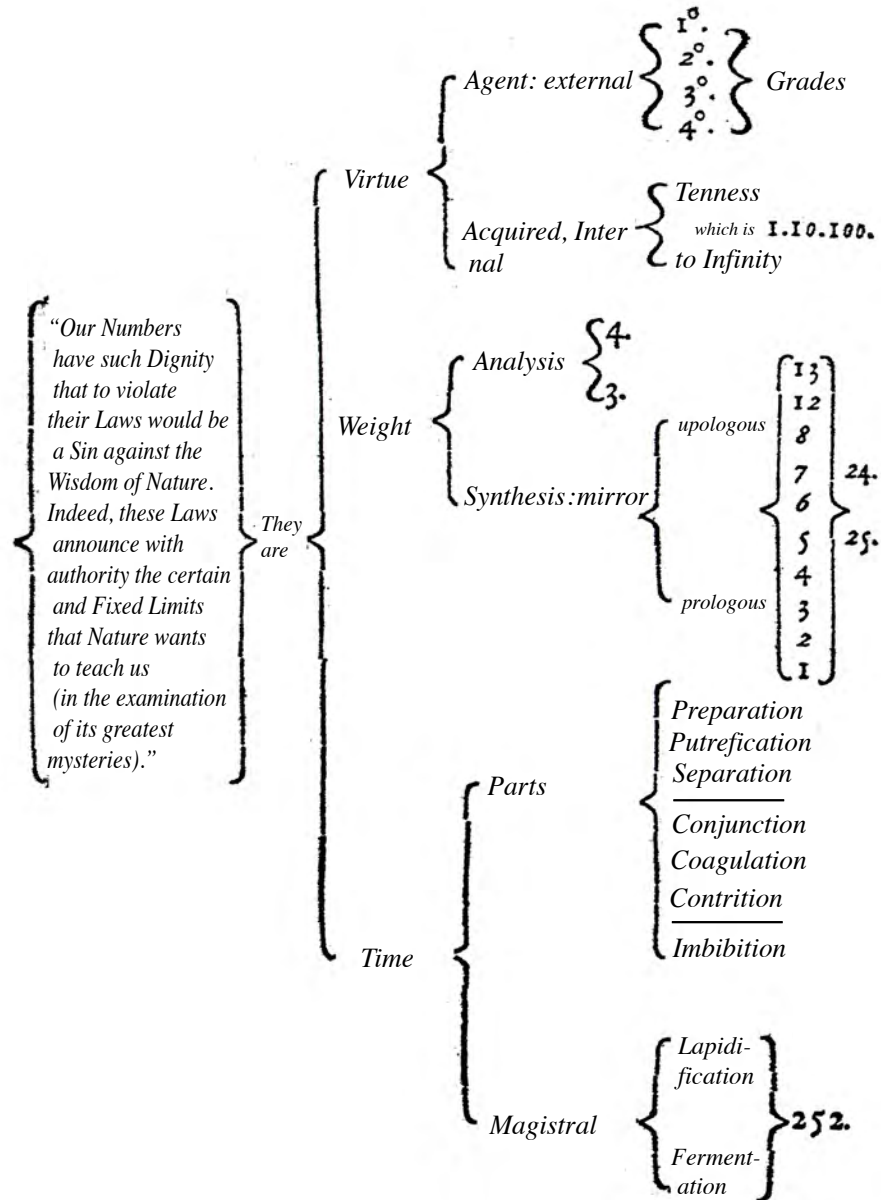


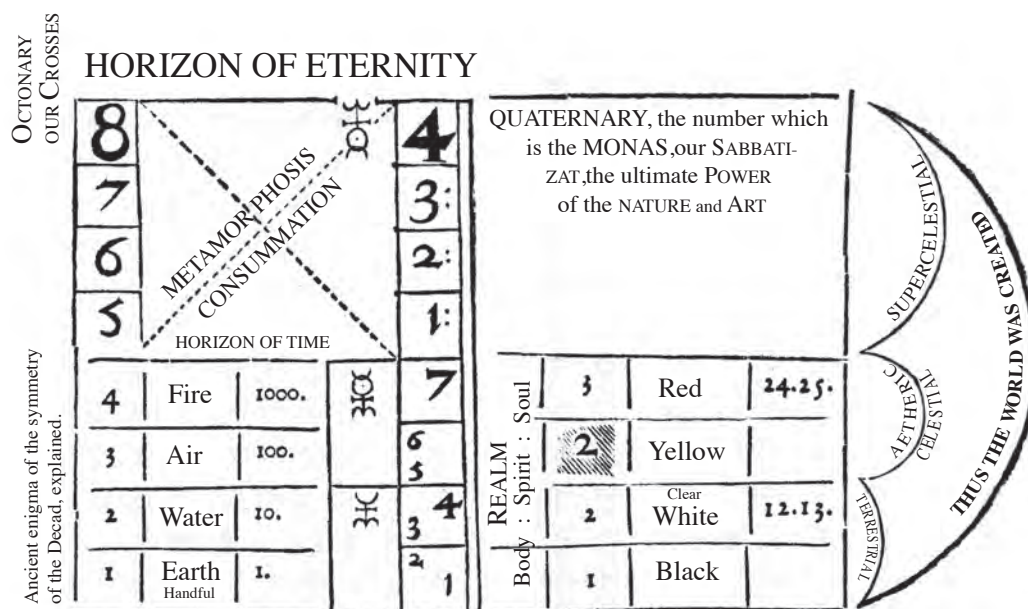
I am Indeed not Ignorant that, from the Arithmetical Virtue and FORMAL NATURE of the QUATERNARY, very many other Numbers could be brought to light.

But HE who does not understand how their greatly concealed Nature is to be developed and illuminated would feel his intellect blunted, not sharpened by a greater multitude of them.

Therefore, the carefully considered diagrams which follow show how our Numbers Originate in the WEIGHING OF ELEMENTS, marking the MEASURES OF TIME, and finally in the ordering of the STEPS of the Power and Virtues of Things.







Words cannot express the many things that can be drawn forth from these Diagrams (if they are deeply contemplated).

So we give here one Reason, above all others (which, together with this whole new art, we divulge from the first time) why the QUATERNARY, as well as the DENARY impose, for the common good, certain limits in Numeration.

We assert that the reason-  
is not as complete and exact as the



It is neither in the power

impel any MOVEMENT or progress UNLESS IT BE BY FOUR

Supercelestial Revolutions.

ing, which our Ancestors extolled  
one we will now make known.  
of NATURE, nor any ART to

After this, the MONAD will be wholly and fully Physically Restored (then, indeed, it is a MOST UNITED MONAS, what the Magi proclaim as ONENESS).

27 verso

(And thus is brought forth for us, He, whom, on account  
” of his eminence, we wish to denote in this way [as inverted].)  
” This is so because there is no OVERFLOWING CRE-  
” ATIVE power in the Elemental world, nor the Celestial, nor the  
” SUPERCELESTIAL, with which it has not been most completely  
” enriched and endowed.



FOUR Famous Men who were Philosophizing together (in times past), through their labors, grasped its real Effect. For a long time, they were Astonished by the Great Wonder of the Thing. Then, at length, they devoted themselves entirely to Singing and preaching Praises of the Most Good and Great God. On account of this, they were granted great Abundance, as well as the Wisdom and Power to rule over other CREATURES.

**THEOR. 24**

In the Beginning of this Little Book, we started with a Point, a Straight Line, and a Circle.

1. Now, at the End, like a Circle Completing Itself, we have a POINT, LINE, and our ELEMENTS Flowing Out of our MONAD, which is Analogous to the Equinoctial when a Circuit is completed in 24 Hours.
2. THUS, at last, in this our Twenty-Fourth Theorem, we shall Consummate and Conclude with the METAMORPHOSIS of ALL THE TRANSPOSITIONS OF PARTS OF A QUATERNARY (defined by the Number 24).
3. HONOR and GLORY to Him, who Sitteth on the Throne (as John, Chief Protector of Divine Mysteries Testifies in the FOURTH, AND LAST verse of the FOURTH Chaper of Revelations).
4. AROUND Whom were four Animals (each having SIX WINGS), DAY and NIGHT, without rest, declaring Holy, Holy, Holy, Lord God Almighty, Who was, Who is, and Who will come.
5. And WHOM, 24 ELDERS, in 24 Seats, placed in a CIRCLE, falling forwards prostrate (HAVING CAST OFF THEIR GOLDEN CROWNS) adore, saying:

Thou art Worthy, O Lord, to receive the GLORY and the HONOR and the POWER,

FOR THOU HAST CREATED ALL THINGS.

Because of THY WILL, THEY ARE,  
AND HAVE BEEN CREATED.

AMEN, SAYS  
THE FOURTH LETTER,

Δ :

*To whom GOD gave the  
Will and Ability to record  
this Divine Mystery in a  
Written Memorial, and to  
complete these his Labors  
peacefully on January 25th,  
having begun on the 13th  
day of the same*

---

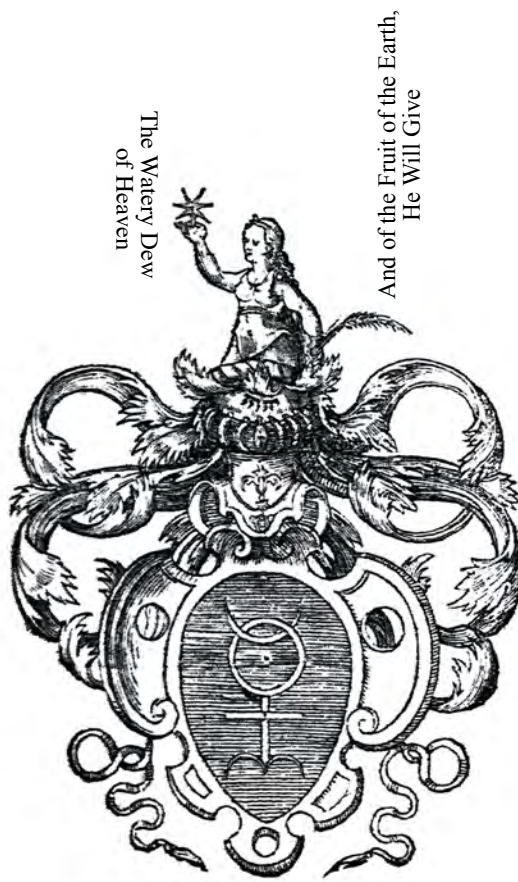
*In the year 1564, Antwerp.*



*The Eye of the Vulgar  
will, here, be Obscured  
and most Distrustful*

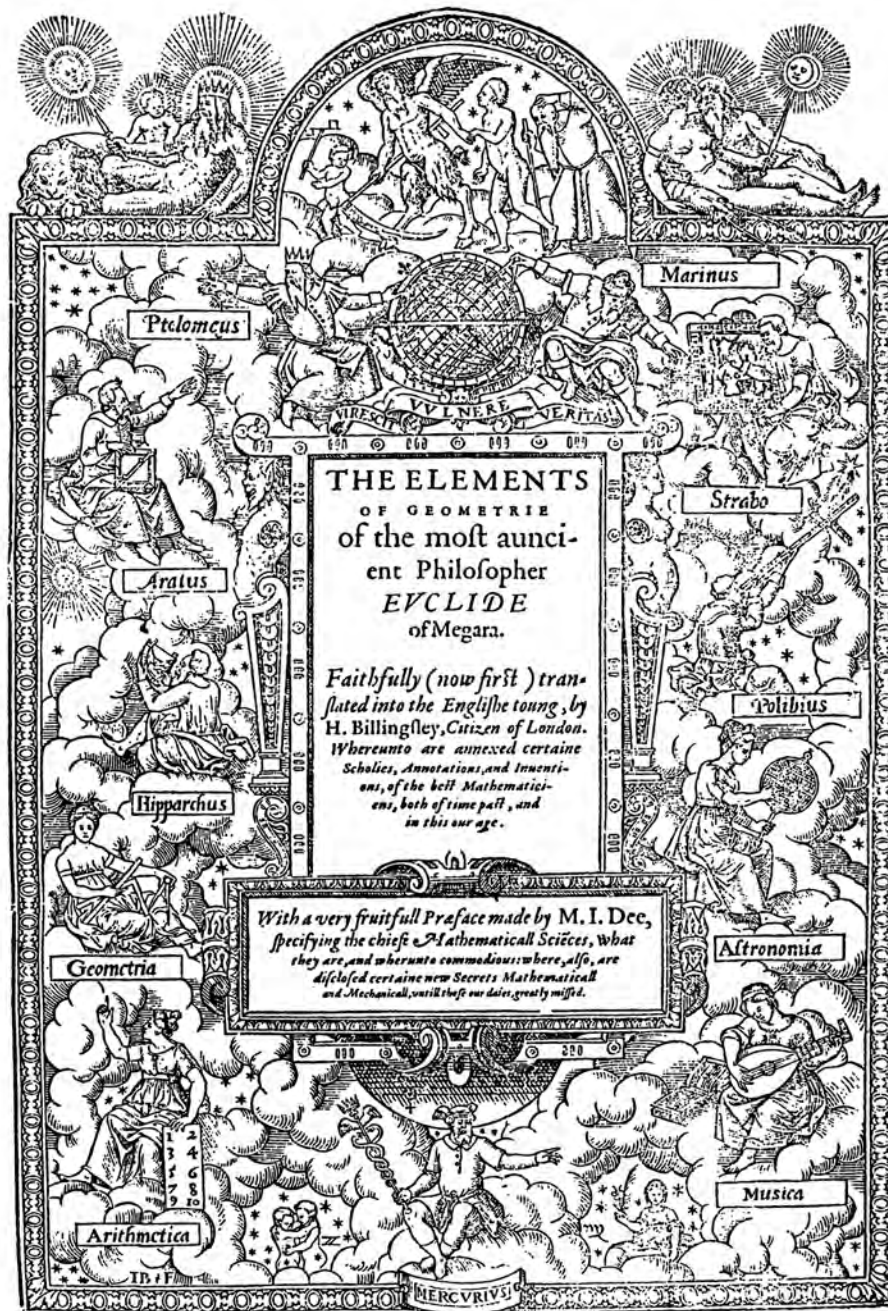
ANTWERP:  
PREPARED BY GULIELMUS SILVIO, ROYAL TYPO-  
GRAPHER: ON THE DAY BEFORE THE  
FIRST DAY OF THE MONTH OF APRIL, IN THE YEAR 1564





The Watery Dew  
of Heaven

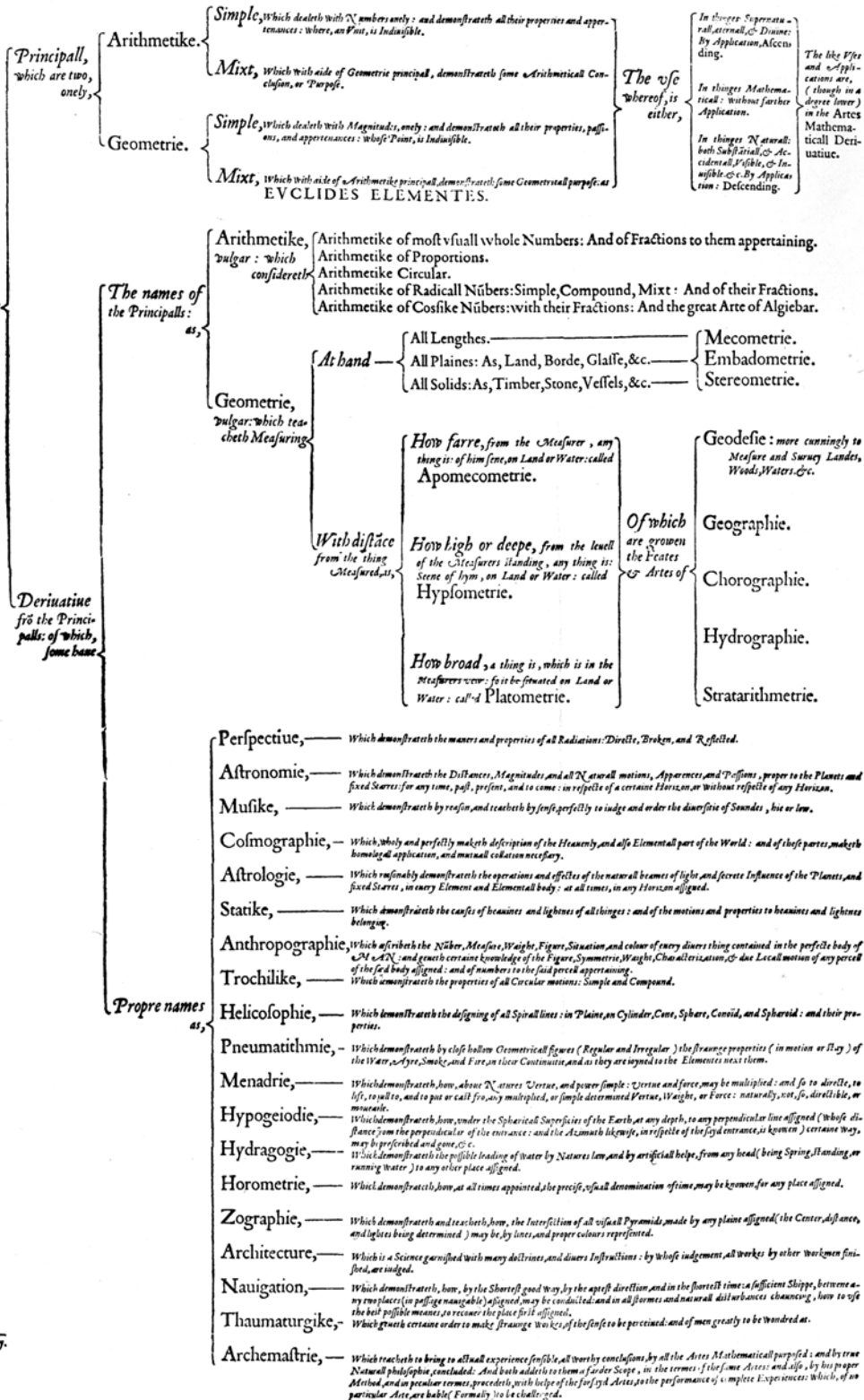
And of the Fruit of the Earth,  
He Will Give



# Here haue you (according to my promise) the Groundplat of my MATHEMATICALL Preface: annexed to *Euclide* (now first) published in our English tongue. An. 1570. Febr. 3.

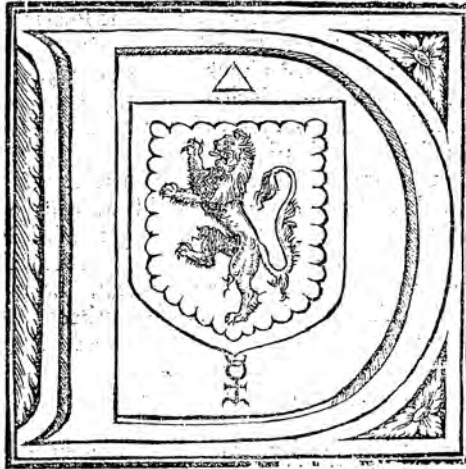
Sciences,  
and Artes  
Mathematicall,

are, either





**TO THE VNFAINED LOVERS**  
 of truthe, and constant Studentes of Noble  
*Sciences, IOHN DEE of London, hartly*  
 wissheth grace from heauen, and most prospe-  
 rous successe in all their honest attempts and  
 exercises.



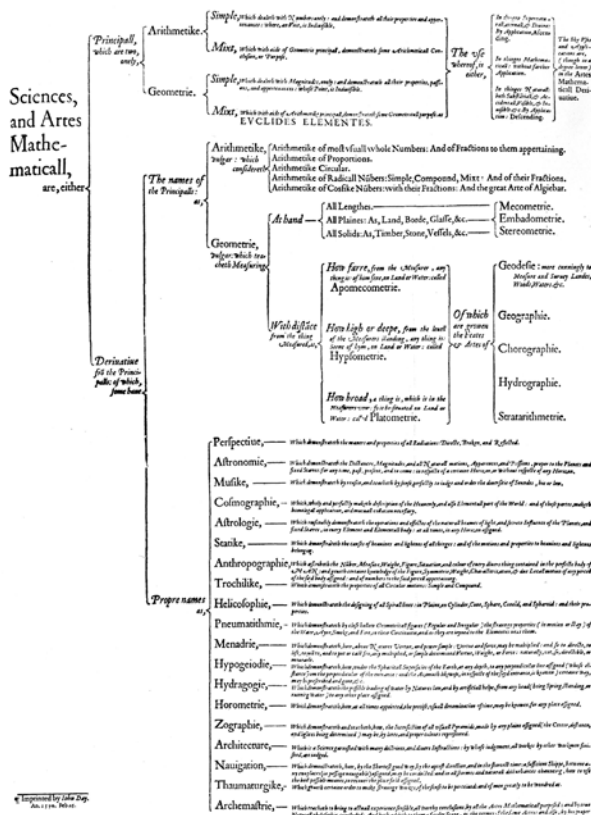
Iuine *Plato*, the great Master  
 of many worthy Philosophers,  
 and the constant auoucher, and  
 pithy perswader of *Vnum*, *Bo-  
 num*, and *Ens*: in his Schole and  
 Academie, sundry times (besides  
 his ordinary Scholers) was visited  
 of a certaine kinde of men, allured  
 by the noble fame of *Plato*, and  
 the great commendation of hys  
 profound and profitable doctrine.  
 But when such Hearers, after long  
 harkening to him, perceaued, that  
 the drift of his discourses issued  
 out, to conclude, this *Vnum*, *Bo-  
 num*, and *Ens*, to be Spirituall, Infi-  
 nite, Aeternall, Omnipotent, &c.

Nothing beyng alledged or expresse, How, worldly goods: how, worldly digni-  
 tie: how, health, Stréngth or lustines of body: nor yet the meanes, how a merueilous  
 sensible and bodyly blysse and felicitie hereafter, might be atteyned: Straightway,  
 the fantasies of those hearers, were damp: their opinion of *Plato*, was clene chaun-  
 ged: yea his doctrine was by them despised: and his schole, no more of them visi-  
 ted. Which thing, his Scholer, *Aristotle*, narrowly cōsidering, founde the cause ther-  
 of, to be, For that they had no forwarnyng and information, in generall, whereto  
 his doctrine tended. For, so, might they haue had occasion, either to haue forborne  
 his schole hauntyng: (if they, then, had misliked his Scope and purpose) or con-  
 stantly to haue continued therein: to their full satisfaction: if such his finall scope &  
 intent, had ben to their desire. Wherefore, *Aristotle*, euer, after that, vsed in brief, to  
 forewarne his owne Scholers and hearers, both of what matter, and also to what  
 ende, he tooke in hand to speake, or teach. While I consider the diuerse trades of  
 these two excellent Philosophers (and am most sure, both, that *Plato* right well, o-  
 therwise could teach: and that *Aristotle* mought boldly, with his hearers, haue  
 dealt in like sorte as *Plato* did) I am in no little pang of perplexitie: Bycause, that,  
 which I mislike, is most easy for me to performe (and to haue *Plato* for my exāple.)  
 And that, which I know to be most commendable: and (in this first bringyng, into  
 common handling, the *Artes Mathematicall*) to be most necessary: is full of great  
 difficultie and sundry daungers. Yet, neither do I think it mete, for so straunge mat-  
 ter (as now is ment to be published) and to so straunge an audience, to be bluntly,  
 at first, put forth, without a peculiar Preface: Nor (Imitatyng *Aristotle*) well can I  
 hope, that accordyng to the amplenés and dignitie of the *State Mathematicall*, I  
 am able, either playnly to prescribe the materiall boundes: or precisely to expresse  
 the chief purposes, and most wonderfull applications therof. And though I am  
 sure, that such as did shrink from *Plato* his schole, after they had perceiued his fi-  
 nall



J. DEE.

Here haue you (according to my promise) the Groundplat of  
my MATHEMATICALL Preface: annexed to *Euclide* (now first)  
published in our English tongue. An. 1570. Febr. 3.



Printed by *Lake Day*  
Astoria, Ore., U.S.A.

John Dee his Mathematicall Præface.

nall conclusion, would in these things haue ben his most diligent hearers:) so infinitely mought their desires, in fine and at length, by our *Artes Mathematicæ* be satisfi-  
fied; yet, by this my Preface & forewarning, Alweill all such may (to their great be-  
heho:) the sooner, hither be allured: as also the *Pythagorickall*, and *Platonickall* perfect  
scholer, and the constant professed Philosopher, with more ease and speede, may  
(like the Bee.) gather, hereby, both wax and honey.

Wherefore, I finde great occasion (for the causes alleged, and farther, in respect of my *Art Mathematicke* generally) to vfe a certaine forewarning and Preface; whose content shalbe, that mighty, most pleasaunt, and frutefull *Mathematicall Tree*, with his chief armes and second (grifted) branches: Both, what euerie one is, and also, what commoditie in general, is to be looked for, as well of griff as stocke: And forasmuch as this enterprise is lo great, that, to this our tyme, it neuer was (to my knowledge) by any achieved: And also it is most hard, in these our dreery dayes, to such rare and straunge Artes, to wyn due and common credit: Neuertheless, if, for my sincere endeavour to satisfie your honest expectation, you will but lend me your thankfull mynd a while; and, to such matter as, for this tyme, any penne (with speede) is hable to deliuer, apply your eye or care attentively: perchance, at once, and for the first saluting, this Preface you will finde a lesion long enough, And either you will, for a second (by this) be made much the happier: or finally become, well hable your selues, of the Lyons claw, to conticure his ayrt of symetrie, and farder propertie. Now then, gentle, my friends, and country men, Turne your eyes, and bend your myndes to that doctrine, which for our present purpose, my simple talent is hable to yield you.

All things which are, & have being, are found vnder a triple diuerſitie general.  
 For, either, they are denied Supernatural, Natural, or, of a third being. Things  
 Supernatural, are immaterial, ſimple, indiſiſible, incorruptible, & vnchangeable.  
 Things Natural, are material, compounded, diſiſible, corruptible, and changeable.  
 Things Supernatural, are, of the minde only comprehended: Things Natural,  
 of the ſenſe exterior, ar haile to be perceived. In things Natural, probability  
 and coniecture hath place: But in things Supernatural, chief demoftration, & moſt  
 ſure Science is to be had. By which properties & comparſons of theſe two, more  
 eaſily may be deſcribed, the ſtate, condition, nature and property of thoſe things,  
 which, we before termed of a third being: which, by a peculiar name alſo, are called  
*Things Mathematical*. For, theſe, being, (in a manner) middle, betwene things ſu-  
 pernatural and natural: are not ſo abſolute and excellent, as things ſupernatural:  
 Nor yet ſo baſe and groſſe, as things natural: But are things immaterial: & ne-  
 ceſſarily, by material things haile ſomewhat to be figured. And though theſe  
 particular Images, by Art, are aggregable and diſiſible: yet the general *Formes*,  
 notwithstanding, are conſtant, vnchangeable, vnſhiftable, and incorruptible.  
 Neither of the ſenſe, can they at any time, be perceived or iudged. Nor yet, for all  
 that, in the roayl mynde of man, firſt conceived. But ſurmounting the imperfection  
 of coniecture, weenyng and opinion: and commyng forth of high intellectuall con-  
 ceptions, are the Mercurial fruite of *Diſcretall* diſcourſe, in perfect imagination ſub-  
 ſiſting. A meruallous neutrality haue theſe things *Mathematical*, and alſo a  
 ſtraunge participation betwene things ſupernatural, immortal, intellectuall, ſimple  
 and indiſiſible: and thynges natural, mortall, ſenſible, compounded and diſiſible.  
 Probability and ſenſible proofe, may well ſure in things natural: and is commend-  
 able: In Mathematical reaſonings, a probable Argument, is nothing regarded:  
 nor yet the teſtimony of ſenſe, any whit credited: But only a perfect demoftration,  
 of truths certaine, neceſſary, and inuincible: vniuerſally and neceſſarily con-

TO THE VNFAINED LOVERS

of truthe, and constant Studentes of Noble  
*Sciences, JOHN DEE of London, hartly*  
 wifeth grace from heaven, and most prosper-  
*ous successe in all their honest attempts and*  
 exercises.



**I**uine *Plato*, the great Master of many worthy Philosophers, and the constant auoucher, and antipathy perfwader of *Vnum*, *Bonum*, and *Ens*: in his Schole and Academie, fundry times (besides his ordinary Scholars) was visited of a certaine kinde of men, allured by the noble fame of *Plato*, and the great commendation of his profound and profitable doctrine. But when such Hearers, after long harkening to him, perceived, that the drift of his discourses issued out, to conclude, this *Vnum*, *Bonum*, and *Ens*, to be Spirituall, Infinite, Eternall, Omnipotent, &c.

Nothing being alleged or expreffed, How, worldly goods: how, worldly dignitie, health, Strength, or luftines of Body: nor yet the meanes, how a merciful fenfible and bodily life: and felicitie hereafter, might be attained: Straghtway, the fancties of thofe heaers, were damp't: their opinion of *Plato*, was clene chaunged: yea his doctrine was by them defpised: and his fchoule, no more of them vifited. Which thing, his Scholer, *Aristotle*, narrowly confidering, founde the caufe thereof, to be, For that they had no forwarding and information, in generall, whereto his doctrine tended. For fo, might they haue had occafion, either to haue forborne his fchoule haunting: (if they then, had miliked his Scope and purpofe) or conftantly to haue continued therein: to their full fatisfaction: if fuch his final Scope & intent, had ben to their defire. Wherefore, *Aristotle*, euer, after that, vfed in briefe, to forewarne his owne Scholers and heares, both of what matter, and alfo to what end, he tooke in hand to fpeake, or teach. While I confider the diuerfe trades of thefe two excellent Philofophers (and am moft fure, both, that *Plato* right well, or otherwife could teach: and that *Aristotle* might boldly, with his heares, haue dealt in like fort as *Plato* did) I am in no little pang of perplexitie. Bycaufe, that, which I milike, is moft eafy for me to performe (and to haue *Plato* for my exaple.) And that, which I know to be moft commendable: and (in this firft bringing into common handling, the *Artes Mathematicall*) to be moft neceffary: is full of great difficultie and fundry dangers. Yet, neither do I thinke it mete, for fo ftraunge matter (as now is ment to be publifhed) and to fo ftraunge an audience, to be blunty, at firft, put forth, without a peculiar Preface: Nor (Imitating *Aristotle*) well can I hope, that according to the amplexes and dignitie of the *State Mathematicall*, I am able, either plainly to prefcribe the materiall boundes: or precifely to exprefle the chief purpofes, and moft wonderfull applications thereof. And though I am fure, that fuch as did fhinke from *Plato* his fchoule, after they had perceived his fi-  
nall

## John Dee his Mathematicall Præface.

cluded: is allowed as sufficient for an Argument exactly and purely Mathematical. »

Of Mathematical things, are two principall kinds; namely, *Namber*, and *Magnitude*. *Namber*, we define, to be a certayne Mathematical Summe, of *Unit*. And an *Unit*, is that thing Mathematicall, Indivisible, by participation of some likenes of whose property any thing, which is in deede, or is counted One, may reasonably be called One. We account an *Unit*, a thing Mathematicall, though it be no *Namber*, and also indivisible; because, of it, eternally, Number doth consist: which, principally, is a thing Mathematicall. *Magnitude* is a thing Mathematicall, by participation of some likenes of whose nature, any thing is judged long, broad, or thicker. A thick *Magnitude* we call a *Solide*, or a *Body*. What *Magnitude* fo euer, is *Solide* or *Thicke*, is also broad, & long. A broad magnitude, we call a *Superficies* or a *Plane*. Every playne magnitude, hath also length. A long magnitude, we terme a *Line*. A *Line* is neither thick nor broad, but only long: Euey certayne *Line*, hath two ends: The ends of a line, are *Pointes* called. A *Point* is a thing Mathematicall, indivisible, which may haue a certayne determined situation. If a *Poynt* moue from a determined situation, the way wherein it moued, is also a *Line*: mathematically produced, whereupon, of the ancient Mathematiciens, a *Line* is called the race or course of a *Point*. A *Point* we define, by the name of that thing Mathematicall: though it be no *Magnitude*, and indivisible: because it is the proper end, and bound of a *Line*: which is a true *Magnitude*. And *Magnitude* we may define to be that thing Mathematicall, which is diuisible for euery, in partes diuisible, long, broad or thicke. Therefore though a *Poynt* be no *Magnitude*, yet *Terminatiue* we reckon it a thing *Mathematicall* (as I sayd) by reason it is properly the end, and bound of a line.

Neither *Number* nor *Magnitude* have any Materialitie. First, we will consider of *Number*, and of the Science *Mathematicall*, to it appropriate, called *Arithmetike*; and afterward of *Magnitude*, and his Science, called *Geometrie*. But that name contenteth me not: whereof a word is, who therof shall be fayed. How Immateriall and free from all matter, *Number* is, two doth not perceive: yea, who doth not wonderfully wude at it? For, neither pure Element, nor *Aristoteles*, *Quinta Essentia*, is hable to sever for *Number*, as his proper matter. Nor yet the puritie and simplicitie of Substance Spirituall or Angelicall, will be found more plain, enough thereto. And therefore the great & godly Philosopher *Annius Boetius*, says: *Omnia quacunq; a prima rerum natura sunt confecta* [just, *Numerum* non videtur ratione formata. Hoc enim fuit principium in animo Creatoris Exemplar. That is: All things (which from the very first originall being of things, have bene framed and made) do appeare to be Formed by the reason of *Numbers*. For this was the principall example or patterne in the minde of the Creator. . . O comfortable Assurance, O rauenishing perswasion, to deale with a Science, whose Subiect, is so Ancient, so pure, so excellent, so summounting all creatures, so vied of the Almighty and incomprehensible widdome of the Creator, in the distinct creation of all creatures: in all their distinct partes, properties, natures, and vertues, by order, and most aboue number, brought, from *Nothing*, to the *Formalitie* of their being and state. By *Number*: properties therefore, of vs, by all possible meanes, (to the perfection of the Science) learned, we may both winde and draw our selues into the inward and deepe search and vew, of all creatures distinct vertues, natures, properties, and *Formes*: And also, farder, arise, climb, ascend and mount vp (with Speculative winges) in spirit, to behold in the Glas of Creation, the *Forme of Formes*, the Exemplar *Number* of all things *Numberable*: both visible and invisible: morrall and



## John Dee his Mathematicall Præface.

immortal, Corporall and Spirituall. Part of this profound and diuine Science, had *Teach* the Prophetie attreyned vnto by *Numbers Formall, Naturall, and Rationall*, Forcynge, concluding, and forthwearing great particular euents, long before their comming. His booke yet remaining, hereof are good profite: And the noble Earle of *Mirandola*, (besides that, a sufficient witteffe that *Teach* in his propheticke, proceeded by no other way, then by *Numbers Formall*. And this Earle hym selfe in Rome, "let vs goe. Conclusions, in all kinde of Sciences, openly to be disputed of: and among the rest, in his Conclusions *Arithmetically*, (in the eleventh Conclusion) hath in Latin, this English sentence. *By Numbers a way is had, to the searching out, and vnderstanding of euery thing, hable to be knowne. For the verifying of which Conclusion, I promise to answer to the 74. Questions, tender written, by the way of Numbers. Which Conclusions, I omit here to rehearse: as well auoiding superfluous prolixities, as by cause I haue manye, are commonly had. But, in any case, I would with that thoe Conclusions were red diligently, and perceived of such, as are earnest Obseruers and Considerers of the constant law of numbers: which is planted in thyngs Naturall and Supernaturall: and is prescribed to all Creatures, inuolubly to be kept. For, so, besides many other thyngs, in thoe Conclusions, to be marked, it would appeare, how finely, & within my boundes, I disclose the wonderfull mysteries, by numbers, to be attreyned vnto.*

Of my former wordes, easily it is to be gathered, that *Number* hath a treble flatte: One, in the Creator: another in euery Creature (in respect of his complete constitution: and the third, in Spirituall and Angelicall Myndes, and in the Soule of mā. In the first and third flatte, *Number*, is termed *Number Numbring*. But in all Creatures, otherwife, *Number*, is termed *Nūber Numbred*. And in our Soule, Nūber beareth such a fwaye, and hath such an affinitie therewith: that some of the old *Philosophers* taught, *Mans Soule, to be a Number mouing it selfe*. And in dede, in vs, though it be a very Accident: yet such an Accident it is, that before all Creatures it had perfect beyng, in the Creator, Sempiternally. *Number Numbring* therefore, is the direction discerning, and distinguishing of thyngs. But in God the Creator, this direction, in the beginning, produced orderly and distinctly all thyngs. For his *Numbring*, then, was his Creatyng of all thyngs. And his Continuall *Numbring*, of all thyngs, is the Conseruation of them in being: And, where and when he will take it off: *Num* there and then, that particular thyng shall be *Discreet*. Here I say. But our Seuerallyng, distinguishing, and *Numbring*, createth nothing: but of Multitude considered, maketh certaine and distinct determination. And albeit these thyngs be waighty and truthe of great importance, yet (by the infinite goodnes of the Almighty *Ternarie*), Artificiall Methods and easy wayes are made, by which the zealous Philosopher, may wyn nere this *Ruierith Ide*, this Mountayne of Contemplation: and more then Contemplation. And also, though *Number*, be a thyng so immateriall, so diuine, and eternall: yet by degrees, by litle and litle, stretchyng forth, and applying some likenes of it as first, to thyngs Spirituall: and then, bryngyng it lower, so thyngs sensibly perceived: as of a momentanye sounde iterated: then to the least thyngs that may be seen, numerable: And at length, (most graciously), to a multitude of any corporall thyngs seen, or felt: and so, of these grosse and sensible thyngs, we are trayned to leame a certaine Image or likenes of numbers: and to vñe Arte in then to our pleasure and profite. So grosse is our conseruation, and dull is our apprehension: while mortall Sense, in vs, ruleth the common wealth of our litle world. Hereby we say, Three Lyons, are three: or a *Ternarie*. Three Eagles, are three, or a *Ternarie*. Which *Ternaries*, are eche, the *Unit*, *Not*, and *Unit*, of three discrete and distinct *Unit*s. That is, we may in eche *Ternarie*, thrise, severally point, and then a part, *One*, *One*, and *One*. Where, in Numbring, we say *One*, *two*, *Three*,

## John Dee his Mathematicall Præface.

them, which, *Arithmetike* of whole Numbers most visuall, would say they had no such Roote: and so account them *Surd Numbers*: which, generally spokē, is vntrue: as *Euclides* tenth booke may teach you. Therefore to call them, generally, *Radicall Numbers*, (by reason of the signe  $\sqrt{\quad}$  prefixed), is a sure way: and a sufficient generall distinction from all other ordyng and vñg of Numbers. And yet (beside all this) Consider: the infinite desire of knowledge, and incredible power of mans Search and Capacity: how they, ioyntly haue waded farther (by mixtyng of speculation and practice) and haue found out, and attreyned to the very chief perfection (almost) of *Numbers* Practicall vñe. Which thing, is well to be perceived in that great Arithmetically Arte of *Equation*: commonly called the *Rule of Cass*, or *Algebra*. The Latines termed it, *Regula Rei et Censui*, that is, the *Rule of the thyng and his value*. With an apt name: comprehending the first and last pointes of the worke. And the vulgar names, both in Italian, Frenche and Spanishe, depend (in namyng it), vpon the signification of the Latin word, *Res*: A thyng: vñeleast they vñe the name of *Algebra*. And therein (commonly) is a dubble error. The one of them, which thinke it to be of *Gheber* his inuentyng: the other of such as call it *Algebra*. For, first, though *Gheber* for his great skill in Numbers, Geometry, Astronomy, and other maruallous Artes, inought haue sēmed hable to haue first deuised the sayd Rule: and also the name carryeth with it a very nere likenes of *Gheber* his name: yet true it is, that a *Greek* Philosopher and Mathematicien, named *Diophantus*, before *Gheber* his tyme, wrote 13 bookes thereof (of which, six are yet extant: and I had them to vñe, of the famous Mathematicien, and my great frende, *Petrus Montanvren*.) And secondly, the very name, is *Algebra*, and not *Algebra*: as by the Arabian *Auicenn*, may be proued: who hath these precise wordes in Latine, by *Andreas Alpagaui* (most perfect in the Arabik tūg) so translated. *Scientia sciendi Algebar et Almachabel*. i. *Scientia sciendi numerum ignotum, per additionem Numeri, & diuisionem & equationem*. Which is to say: *The Science of working Algebar and Almachabel*, that is, the Science of finding an unknown number, by Adding of a Number, & Diuision & equation. Here haue you the name: and also the principal part of the Rule, touched. To name it, *The Rule, or Art of Equation*, doth signify the middle part and the State of the Rule. This Rule, hath his peculiar Characters: and the principal partes of *Arithmetike*, to it appertayning, do differ from the other *Arithmetically operations*. This *Arithmetike*, hath *Nūber*: Simple, Copound, Mixt: and Fractions, accordingly. This Rule, and *Arithmetike* of *Algebra*, is so profound, so generall and so (in maner) contyneth the whole power of Numbers Application practically: that mans wit, can deale with nothing, more profitable about numbers: nor match, with a thyng, more mete for the diuine force of the Soule, (in humane Studies, Affaires, or exercises) to be tryed in. Perchaunce you looked for, (long ere now), to haue had some particular profite, or euident testimony of the vñe, profite and Commodity of Arithmetike vulgar, in the Common lye and trade of men. Therto, then, I will now frame my selfe: But herein great care I haue, least length of thyngs, might make you deme, that either I did misdoute your zealous mynde to vertues schole: or els mistrust your hable wites, by some, to gesse much more. A profite then, foure, five, or six, fuch, I will try, as any reasonable man, therewith may be persuaded, so loue & honor, yea leame and exercise the excellent Science of *Arithmetike*.

And first: who, neuer at hand, can be a better witnesse of the frute received by *Arithmetike*, then all kinde of Marchants? Though not all alike, either nede it, or vñe it. How could they forebare the vñe and helpe of the Rule, called the Golden Rule?

## John Dee his Mathematicall Præface.

Three. But how farre, chiefe visible Ones, do differ from our Indivisible *Unit*s (in pure *Arithmetike*, principally considered) no man is ignorant. Yet from these grosse and materiall thyngs, may we be led upward, by degrees, so, informing our rude Imagination, toward the conceyning of *Numbers*, absolutely (not supposing, nor admixtyng any thyng created, Corporall or Spirituall, to support, conteyne, or represent those *Numbers* imagined): that at length, we may be hable, to finde the number of our owne name, gloriously exemplified and registred in the booke of the *Trinitie* most blessed and eternall.

But farther vnderhand, that vulgar Practises, haue Numbers, otherwife, in sundry Considerations: and extend their name farther, then to Numbers, whose least part is an *Unit*. For the common Logist, Recknemaister, or Arithmeticien, in hys vñg of Numbers: of an *Unit*, imagineth leffe partes: and calleth them *Fractions*. As of an *Unit*, he maketh an halfe, and thus noteth it,  $\frac{1}{2}$ , and so of other, (infinitely diuerse) partes of an *Unit*. Yea and farther, hath, *Fractions of Fractions*. &c. And, forasmuch, as, *Addition*, *Subtraction*, *Multiplication*, *Diuision* and *Extraction of Roote*, are the chief, and sufficient partes of *Arithmetike*: which is, the Science that demonstrateth the properties of Numbers, and all operations, in numbers to be performed: How often, therefore, these five sundry fortes of Operations, do, for the most part, of their execution, differ from the five operations of like generall property and name, in our Whole numbers practisable, so often, (for a more distinct doctrine) we, vulgarly, account and name it, an other kynde of *Arithmetike*. And by this reason: the Consideration, doctrine, and working, in whole numbers only: where, of an *Unit*, is no leffe part to be allowed: is named (as it were) an *Arithmetike* by it selfe. And so of the *Arithmetike of Fractions*. In lyke sorte, the necessary, wonderfull and Secret doctrine of Proportion, and proportionallytie hath purchased vnto it selfe a peculiar manner of handling and working: and so may seme an other forme of *Arithmetike*. Moreover, the *Astronomers*, for spede and more commodious calculation, haue deuised a peculiar manner of orderyng *Nūbers*, about their circular motions, by Sexages, and Sexagesimes. By Signes, Degrees and Minutes &c. which commonly is called the *Arithmetike of Astronomical or Physicall Fractions*. That, haue I briefly noted, by the name of *Arithmetike Circular*. By cause it is also vñed in circles, not *Astronomically* &c. Practice hath led *Numbers* farther, and hath framed them, to take vpon them, the shew of *Magnitudes* properties: Which is *Incommensurabilitie and Irrationalitie*. (For in pure *Arithmetike*, an *Unit*, is the common Measure of all Numbers.) And here, *Nūbers* are become, as *Lynes*, *Playnes* and *Solides*: some tymes *Rational*, some tymes *Irrational*. And haue propre and peculiar characters, (as  $\sqrt{2}$ ,  $\sqrt{3}$ , &c. and so of other. Which is to signify *Roote Square*, *Roote Cubick*: and so forth.) & propre and peculiar fashions in the five principal partes: Wherefore the practiser, esteemeth this, a diuerse *Arithmetike* from the other. Practice bryngeth in, here, diuerse compounding of Numbers: as some tyme, two, three, foure (or more) *Radicall* *Nūbers*, diuerfly knit, by signes, of More & Lesse: as thus  $\sqrt{5} \cdot 12 + \sqrt{6} \cdot 15$ , Or thus  $\sqrt{8} \cdot 19 + \sqrt{6} \cdot 12 - \sqrt{5} \cdot 2$ , &c. And some tyme with whole numbers, or fractions of whole Number, among them: as  $20 + \sqrt{8} \cdot 24 + \sqrt{6} \cdot 16 + 33 - \sqrt{5} \cdot 10 - \sqrt{8} \cdot 44 + 12 \div + \sqrt{6} \cdot 9$ . And so, infinitely, may hap the varietie. After this: Both the one and the other hath fractions incident: and so is this *Arithmetike* greatly enlarged, by diuerse exhibiting and vñe of Compositions and mixtynges. Consider how, (beyng desirous to deliuer the student from error and Caution) do gine to this *Practice*, the name of the *Arithmetike of Radicall numbers*: Not of *Irrational* or *Surd Numbers*: which other while, are *Rational*: though they haue the Signe of a Roote before them,

## John Dee his Mathematicall Præface.

Rule: Simple and Compound: both forward and backward? How might they misse *Arithmetically* helpe in the Rules of Fellowship: either without tyme, or with tyme: and betwene the Marchant & his Factor? The Rules of Bartering in wares only: or part in wares, and part in money, would they gladly want? Our Marchant venturers, and Trauyslers ouer Sea, how could they order their doynyes iustly and without losse, vñleast certaine and generall Rules for Exchange of money, and Rechange, were, for their vñe, deuised? The Rule of Alligation, in how sundry cases, doth it conclude for them, such precise verities, as neither by naturall wit, nor other experience, they were hable, els, to know? And (with the Marchant then to make an end) how ample & wonderfull is the Rule of False positions? especially as it is now, by two excellent Mathematiciens (of my familiar acquaintance in their life tyme) enlarged? I meane *Gemma Frisius*, and *Simon Iacob*. Who can either in brief conclude, the generall and Capitall Rules, or who can I imagine the Myriades of sundry Cases, and particular examples, in Aft and earnest, continually wrought, tried and concluded by the forenamed Rules, only? How sundry other *Arithmetically practises*, are commonly in Marchantes handes, and knowledge: They them selues, can at large, testifye.

The Mintmaister, and Goldsmith, in their Mixture of Metals, either of diuerse kindes, or diuerse values: how are they, or may they, exactly be directed, and mercifully pleased, if *Arithmetike* be their guide? And the honorable Philicis, will gladly confesse them selues, much beholding to the Science of *Arithmetike*, and that sundry wayes: But chiefly in their Art of Graduation, and compound Medicines. And though *Galenus*, *Auerrois*, *Arnaldus*, *Lullus*, and other haue published their positions, alwell in the quantities of the Degrees about Temperament, as in the Rules, concluding the new *Forme* refuting: yet a more precise, commodious, and easy *Method*, is extant: by a Countryman of ours (about 200. y. 8. years ago) inuented. And forasmuch as I am vnertaine, who hath the fame: or when that litle Latin treatise, (as the Author writ it,) shall come to be Printed: (Both to declare the desire I haue to pleasure my Country, wherein I may: and also, for very good profite of *Numbers* vñe, in this most subtiltie and frutefull, Philosophicall Conclusion,) I intend in the meane while, most briefly, and with my farther helpe, to communicate the pith thereto vnto you.

First describe a circle: whose diameter let be an inch. Diuide the Circumference into foure equal partes. Fro the Center, by those 4. sections, extend 4. right lines: eche of 4. inches and a halfe long: or of as many as you like, about 4. without the circumference of the circle: So that they shall be of 4. inches long. (at the least) without the Circle. Make good euident marks, at euery inches end. If you list, you may subdiuide the inches againe into 10. or 12. smaller partes: equal. At the endes of the lines, write the names of the 4. principall elementall Qualities. *Hot* and *Cold*, one against the other. And likewise *Moist* and *Dry*, one against the other. And in the Circle write *Temperate*. Which *Temperature* hath a good Latitude: as appeareth by the Complexion of man. And therefore we haue allowed vnto it, the fore sayd Circle: and not a point Mathematical or Physicall.

Now, when you haue two thyngs Misable; whose degrees are truly known: Of necessity, either they are of one Quantitie and weight, or of diuerse. If they be of one Quantitie and weight: whether their formes be Contrary Qualities, or of one kinde (but of diuerse intentions and degrees) or a *Temperate*, and a Contrary, The forme resulting of their Mixture is in the Middle betwene the degrees of

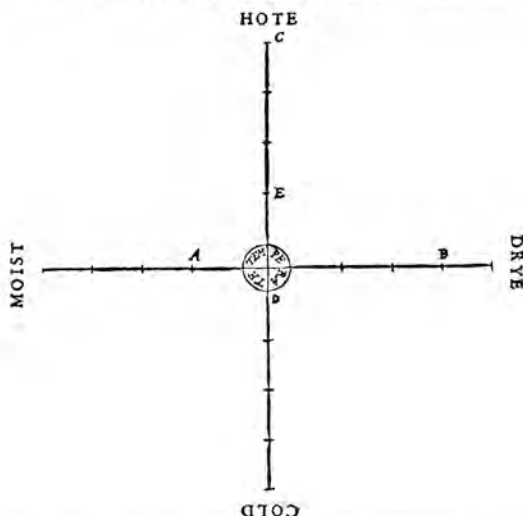
\* Take some parts of Lullus counsaile in his booke de Q. Essentia.

\* iij. the



## John Dee his Mathematicall Præface.

*the formes mixt.* As for example, let *A*, be *Mist* in the first degree: and *B*, *Dry* in the third degree. Adde 1. and 3. that maketh 4: the halfe or middle of 4 is 2. *Note.* This 2 is the middle, equally distant from *A* and *B* (for the *Temperament* is counted none. And for it, you must put a Ciphre, if at any time, it be in mixture).



Counting then from *B*, 2. degrees, toward *A*: you finde it to be *Dry* in the first degree: So is the *Forme* resulting of the Mixture of *A*, and *B*, in our example. I will geue you an other example. Suppose, you have two things, as *C*, and *D*: and of *C*, the Heate to be in the 4. degree: and of *D*, the Colde, to be remisse, even vnto the *Temperament*. Now, for *C*, you take 4: and for *D*, you take a Ciphre: which, added vnto 4, yeldeth only 4. The middle, or halfe, whereof, is 2. Wherefore the *Forme* resulting of *C*, and *D*, is *Hote* in the second degree: for, 2. degrees, accounted from *C*, toward *D*, ende iustle in the 2. degree of heate. Of the third manner, I will geue also an example: which let be this: I have a liquid Medicine whose *Qualitie* of heate is in the 4. degree exalted: as was *C*, in the example foregoing: and an other liquid Medicine I have: whose *Qualitie*, is heate, in the first degree. Of each of these, I mixt a like quantitie: Subtract here, the lesse fro the more: and the residue diuide into two equal partes: whereof, the one part, either added to the lesse, or subtracted from the higher degree, doth produce the degree of the *Forme*.

## John Dee his Mathematicall Præface.

to be reduced: & the *Forme* resulting of the same, to serue the turne) yet these *Rules* are sufficient: duly repeated and iterated. In proceding first, with any two: and then, with the *Forme* Resulting, and an other: & so forth. For, the last worke, concludeth the *Forme* resulting of them all: I neede nothing to speake, of the Mixture (here supposed) what it is. Common Philosophie hath defined it, saying, *Mixtio est miscibilium, alteratorum, per minima coniunctorum, Finis*. Every word in the definition, is of great importance. I neede not also spend any time, to shew, how, the other manner of distributing of degrees, doth agree to these *Rules*. Neither neede I of the farther use belonging to the Croffe of Graduation (before described) in this place declare, vnto such as are capable of that, which I haue all ready sayd. Neither yet with examples specifie the Manifest varieties, by the foresayd two general *Rules*, to be ordered. The witty and Studious, here, haue sufficient: And they which are not hable to attaine to this, without liuely teaching, and more in particular: would haue larger discoursing, then is mete in this place to be dealt withall: And other (perchance) with a proude sniffe will disdain this lide: and would be vnthankfull: for much more, I, therefore conclude: and with such as haue modest and earnest Philosophicall mindes, to laude God highly for this: and to Meruaile, that the profoundest and subtillest point, concerning *Mixture of Formes* and *Qualities* Natural, is so Matcht and maryed with the most simple, easie, and short way of the noble Rule of *Algebra*. Who can remaine, therefore vnperuaded, to loue, allow, and honor the excellent Science of *Arithmetike*: For, here, you may perceiue that the lide finger of *Arithmetike*, is of more might and continuing, then a hundred thousand mens wittes, of the middle sorte, are hable to perfbourne, or truly to conclude, with out helpe thereof.

Now will we farther, by the wife and valiant Capitaine, be certified, what helpe he hath, by the *Rules* of *Arithmetike*: in one of the Artes to him appertaining: And of the Grekes named *Tactica*: That is, the Skill of Ordning Souldiers in Battell Ray after the best manner to all purposes. This Art so much dependeth vpon Numbers use, and the Mathematicals, that *Aelianus* (the best writer thereof,) in his worke, to the *Emperour Hadrianus*, by his perfection, in the Mathematicals, (beyng greater, then other before him had,) thinketh his booke to passe all other the excellent workes, written of that Art, vnto his dayes. For, of it, had written *Eneas: Cyneas of Thebais: Pyrrhus Epivates: and Alexander* his sonne: *Clearchus: Pausanias: Euangelus: Polybius*, familiar frende to *Scipio: Eupolemus: Iphicrates, Possidonius*: and very many other worthy Capitaines, Philosophers and Princes of Immortall fame and memory: Whose fayrest floure of their garland (in this feat) was *Arithmetike*: and a litle percutiurance, in *Geometricall Figures*. But in many other cases doth *Arithmetike* stand the Capitaine in great fiede. As in proportioning of vittayles, for the Army, either remaining at a stay: or suddenly to be encreased with a certaine number of Souldiers: and for a certain tyme. Or by good Art to diminish his company, to make the victuals, longer to serue the remanent, & for a certaine determined tyme: if neede so require. And so in sundry his other accountes, Reckninges, Measurings, and proportionings, the wife, expert, and Circumspect Capitaine will asseme the Science of *Arithmetike*, to be one of his chief Counsaylors, directers and aiders. Which thing (by good means) was euident to the Noble, the Courageous, the loyal, and Courteous *Iohn*, late Earle of Warwicke. Who was a yong Gentleman, thoroughly knowne to very few. Albeit his luffy valiantnes, force, and Skill in Chiuallous feates and exercises: his humbles, and frendlynes to all men, were thinges, openly, of the world perceiued. But what rotes (otherwise,) vertue had fastened in his brest, what *Rules* of godly and honorable life

## John Dee his Mathematicall Præface.

*Forme* resulting, by this mixture of *C*, and *E*. As, if from 4, ye abate 1, there resteth 3. the halfe of 3, is 1.5: Adde to this 1.5: you haue 2.5: Or subtract from 4, this 1.5: you haue likewise 2.5: remayning. Which declareth, the *Forme* resulting, to be *Heate*, in the middle of the third degree.

But if the Quantities of two things Commixt, be diuerse, and the Intensions (of their *Formes* Misible) be in diuerse degrees, and heighthes. (Whether those *Formes* be of one kinde, or of Contrary kindes, or of a Temperate and a Contrary. What proportion is of the lesse quantitie to the greater, the same shall be of the difference, which is between the degree of the *Forme* resulting, and the degree of the greater quantitie of thing misible, to the difference, which is between the same degree of the *Forme* resulting, and the degree of the lesse quantitie. As for example. Let two pound of Liquor be geuen, hote in the 4. degree: & one pound of Liquor be geuen, hote in the third degree. I would gladly know the *Forme* resulting, in the Mixture of these two Liquors. Set downe your numbers in order, thus.

E. 2.	Hote. 4.
E. 1.	Hote. 3.

Now by the rule of *Algebra*, haue I deuised a very easie, briefe, and generall manner of working in this calc. Let vs first, suppose that *Middle Forme* resulting, to be 120: as that Rule teacheth. And because (by our Rule, here geuen) as the weight of 1 is to 2: So is the difference between 4, (the degree of the greater quantitie) and 120: to the difference between 120 and 3: (the degree of the thing, in lesse quantitie. And with all, 120, being alwayes in a certaine middell, between the two heighthes or degrees). For the first difference, I set 4—120: and for the second, I set 120—3. And, now againe, I say, as 1 is to 2, so is 4—120 to 120—3. Wherefore, of these four proportionall numbers, the first and the fourth Multiplied, one by the other, do make as much, as the second and the third Multiplied the one by the other. Let these Multiplications be made accordingly. And of the first and the fourth, we haue 120—3, and of the second & the third, 8—270. Wherefore, our Equation is between 120—3: and 8—270. Which may be reduced, according to the Arte of *Algebra*: as, here, adding 3 to each part, geueth the Equation, thus, 120=11—270. And yet againe, contracting, or Reducing it: Adde to each part, 270: Then haue you 390 equall to 11: thus represented 390=11. Wherefore, diuiding 11 by 3: the Quotient is 3.5: the *Value* of our 120, *Calc*, or *Thing*, first supposed. And that is the heigh, or Intension of the *Forme* resulting: which is, *Heate*, in two thirds of the fourth degree: And here I set the shew of the worke in conclusion, thus. The prouide hercof is easie: by subtracting 3, from 3.5, resteth

E. 2.	Hote. 4.
E. 1.	Hote. 3.

Subtracte the same heigh of the *Forme* resulting, (which is 3.5) fro 4: then resteth 0.5. You see, that 0.5 is double to 0.25: as 2.5 is double to 1.25. So should it be: by the rule here geuen. Note. As you added to each part of the Equation, 3: so if ye still added to each part 270, it would stand, 390—3=8. And now adding to each part 3: you haue (as afore) 390=11. And though I, here, speake onely of two things Misible: and most commonly, mo then three, foure, fve or fix, (&c.) are to be Mixt: (and in one Compound

## John Dee his Mathematicall Præface.

life he had framed to him selfe: what vices, (in some then liuing) notable, he tooke great care to ckeue: what many vertues, in other noble men, (flourishing before his eyes,) he Sythingly aspired after: what prowesses he purposed, and ment to achieve: with what teares and Arres, he began to furnish and fraught him selfe, for the better seruice of his King and Countrey, both in peace & warre. These (I say) his Heroicall Meditations, forecastings and determinations, no twayne: (I thinke) beside my selfe, can so perfectly and truly report. And therefore, in *Compliments*, I count it my part for the honor, preferment, & procuring of vertue (thus, briefly) to haue put his Name, in the Register of *Eame Immortall*.

To our purpose. This *Iohn*, by one of his actes (besides many other: both in England and Fraunce, by me, in him noted,) did disclose his barty loue: to virtuous Sciences, and his noble intent, to excell in Martiall prowesse: When he, with humble request, and instant Solliciting, got the best *Rules* (either in time past by Geke or Romaine, or in our time vsed: and new Stratagemes therein deuised) for ordning of all Companies, summes and Numbers of me (Many, or few) with one kinde of weapon, or mo, appointed: with Artillery, or without: on horsebacke, or on fote: to giue, or take onler: to seem many, being few: to seem few, being many. To marche in battaile or to may: with many such feates to foughen field, Skarmouth, or Ambush: appertaining: And of all these, liuely delinegements (most curiously) to be in velame parchement described: with Notes & peculiar marks, as the Arte requirith, and all these *Rules*, and descriptions Arithmetically, inclosed in a riche Case of Gold, he vied to weare about his necke: as his fuelst most precious, and Countreylour most truly. Thus, *Arithmetike*, of him, was thryned in gold: Of Numbers frute, he had good hope. Now, Numbers therefore innumerable, in *Numbers* prayse, his thyrning liall finde.

What neede I, (for farder profe to you) of the Scholemasters of Iustice, to require testimony: how needfull, how frutefull, how fullfall a thing, *Arithmetike* is? I meane, the Lawyers of all fortres, vndoubtedly, the Ciutillians, can meruayllously declare: how neither the Auncient Romaine lawes, without good knowledge of *Numbers*, art, can be perceived: Nor (Iustice in infinite Cases) without due proportion, narrowly considered, is hable to be executed. How liully, & with great knowledge of Arte, did *Papinianus* institute a law of partition, and allowance, betweene man and wife after a diuorce: but how *Accursius, Baldus, Bartolus, Iafon, Alexander*, and finally *Alciatus*, (being other wise notably well learned) do iumble, gesse, and erre, from the equity, art and intent of the lawmaker: *Arithmetike* can detect, and conuince: and clerely, make the truth to shine. Good *Bartolus*, tyred in the examining & proportioning of the matter: and with *Accursius* Gloffe, much cumbréd: burst out, and sayd: *Nulla est in tota libra: hac glossa difficultior: Cuius computationem nec Scholasticus nec Doctores intelligunt. &c.* That is: In the whole booke, there is no Gloffe harder then this: *Whose account or reckening, neither the Scholesiers giue the Doctors vnderstand, &c.* What can they say of *Italianus* law, *si ita Scriptum &c.* Of the Tellors will liully performing, betweene the wife, Sonne and daughter? How can they perceiue the aquite of *Sphiramus*, *Arithmetically* Reckening, where he treateth of *Lex Falcidia*? How can they deliuer him, from his Reprouers: and their maintainers: as *Ioannes, Accursius Hypolitus* and *Alciatus*? How liully and artificially, was *Africanius* reckening made: Proportionating to the Sommes bequeathed, the Contributions of each part? Namely, for the hundred presently receiued, 17. And for the hundred, receiued after ten monethes, 12. which make the 30: which were to be contributed by the legataries to the heire.

This noble Earle, dyed Anno. 1551. at the age of 54. years of age: having no issue by his wife: Daughter to the Duke of Somerset.



## John Dee his Mathematicall Præface.

For, what proportion, 100 hath to 75: the same hath 17  $\frac{1}{2}$  to 13  $\frac{1}{2}$ : Which is Self-quintaria: that is, as 4, to 3, which make 7. Wonderful many places, in the Civile law, require an expert *Arithmetician*, to understand the deepe Iudgement, & Iust determination of the Auncient Romaine Lawmakers. But much more expert ought he to be, who should be able, to decide with acutie, the infinite varietie of Cases, which do, or may happen, vnder every one of those lawes and ordinances Civile. Hereby, safely, ye may now coniecture: that in the Canon law: and in the lawes of the Realme (which with vs, beare the chief Authoritie), Iustice and equity might be greatly preferred, and skilfully executed, through due skill of *Arithmetike*, and proportions appertaining. The worthy Philosophers, and prudent lawmakers (who haue written many bookes *De Republica*: How the best state of Common wealthes might be procured and maintained,) haue very well determined of Iustice: (which, not onely, is the Base and foundation of Common weales: but also the totall perfection of all our workes, words, and thoughtes:) defining it, to be that vertue, by which, to euery one, is rendered, that to him appertaineth.

God challengeth this our handes, to be honored as God: to be loved, as a Father: to be feared as a Lord & master. Our neighbours proportion, is also prescribed of the Almighty lawmaker: which is, to do to other, euen as we would be done vnto. These proportions, are in Iustice necessary: in duty, commendable: and of Common wealthes, the life, strength, stay and flourishing. *Aristotle* in his *Ethicks* (to fatch the sede of Iustice, and light of direction, to vse and execute the same) was fayne to fly to the perfection, and power of Numbers: for proportions Arithmetickall and Geometrickall. *Plato* in his booke called *Epinomis* (which booke, is the Threasury of all his doctrine) where, his purpose is, to like a Science, which, when a man had it perfectly: he might fence, and so be, in dede, *Wise*. He, briefly, of other Sciences discouering, findeth them, not habile to bring it to passe: But of the Science of Numbers, he sayth, *Haec quæ numerum mortalium generi dedit, id profectus efficit. Deum autem aliquem, magis quam fortunam, ad salutem nostram, hoc munus nobis arbitror contulisse. &c.* Nam ipsum honorum omnium Auctorem, cur non maximi boni, Prudentia dico, consensu arbitramur? That Science, verely, which hath taught man kinde number, shall be able to bring it to passe. And, I thinke, a certaine God, rather then fortune, so haue giuen vs this gift, for our blisse. For, why should we not Iudge him, who is the Author of all good things, to be also the cause of the greatest good thing, namely, *Wisedome*? There, at length, he proueth *Wisedome* to be attained, by good Skill of Numbers. With which great Testimony, and the manifold proofes, and reasons, before exprest, you may be sufficiently and fully persuaded: of the perfect Science of *Arithmetike*, to make this accounte: That of all Sciences, next to *Theologie*, it is most diuine, most pure, most ample and generally, most profounde, most subtle, most commodious and most necessary. Whole next Siler, is the Absolute Science of *Magnitudes*: of which (by the Direction and aide of him, whose *Magnitude* is Infinite, and of vs Incomprehensible) I now entend, so to write, that both with the *Multitude*, and also with the *Magnitude* of Meruaylous and fratefull verities, you (my frendes and Countrey-men) may be firid vp, and awaked, to behold what certaine Artes and Sciences, (to our vn-speakable behoofe) our heauenly father, hath for vs prepared, and reuealed, by sundry Philosophers and Mathematicians.

Both, *Number* and *Magnitude*, haue a certaine Original fede, (as it were) of an incredible property: and of man, neuer habile, Fully, to be declared. Of *Number*, an Vnit, and of *Magnitude*, a Poynte, doo seeme to be much like Original

## John Dee his Mathematicall Præface.

nall causes: But the diuersitie neuertheless, is great. We defined an *Vnit*, to be a thing Mathematicall Indiuisible: A Point, likewise, we sayd to be a Mathematicall thing Indiuisible. And farther, that a Point may haue a certaine determined Situation: that is, that we may assigne, and prescribe a Point, to be here, there, yonder, &c. Herein, (behold) our *Vnit* is free, and can abide no bondage, or to be tyed to any place, or feard diuisible or indiuisible. Agayne, by reason, a Point may haue a Situation limited to him: a certaine motion, therefore (to a place, and from a place) is to a Point incident and appertaining. But an *Vnit*, can not be imagined to haue any motion. A Point, by his motion, produceth, Mathematically, a line: (as we sayd before) which is the first kinde of Magnitudes, and most simple: An *Vnit*, can not produce any number. A Line, though it be produced of a Point moued, yet, it doth not consist of pointes: Number, though it be not produced of an *Vnit*, yet doth it Consist of Vnits, as a materiall cause. But formally, Number, is the Vnion, and Vnitie of Vnits. Which vnying and knitting, is the workmanship of our minde: which, of distinct and discrete Vnits, maketh a Number: by vniormitie, refuting of a certaine multitude of Vnits. And so, euery number, may haue his least part, giuen: namely, an *Vnit*: But not of a Magnitude, (no, not of a Line), the least part can be giue: by cause, infinitely, diuision thereof, may be conceiued. All Magnitude, is either a Line, a Plane, or a Solid. Which Line, Plane, or Solid, of no Sense, can be perceived, nor exactly by had (any way) represented: nor of Nature produced: But, as (by degrees) Number did come to our perceiurance: So, by visible formes, we are holpen to imagine, what our Line Mathematicall, is. What our Point, is. So precise, are our Magnitudes, that one Line is no broader then an other: for they haue no bredth: Nor our Plainnes haue any thickness. Nor yet our Bodies, any weight: be they neuer so large of dimension. Our Bodies, we can haue Smaller, then either Arte or Nature can produce any: and Greater also, then all the world can comprehend. Our least Magnitudes, can be diuided into so many partes, as the greatest. As, a Line of an inch long, (with vs) may be diuided into as many partes, as may the diameter of the whole world, from East to West: or any way extended: What priuiledges, about all manual Arte, and Natures might, haue our two Sciences Mathematicall, to exhibite, and to deale with things of such power, liberty, simplicity, puritie, and perfection? And in them, so certainly, so orderly, so precisely to proceede, as excellent is that workemans Mechanicall Iudged, who nerer can appoche to the representing of workes, Mathematicallly demonstrated? And our two Sciences, remaining pure, and absolute, in their proper termes, and in their owne Matter: to haue, and allowe, onely such Demonstrations, as are plaine, certaine, vniuersall, and of an aternall verity: This Science of *Magnitude*, his properties, conditions, and appertinences: commonly, now is, and from the beginning, hath of all Philosophers, ben called *Geometrie*. But, verely, with a name to baile and feant, for a Science of such dignitie and amplexes. And, perchance, that name, by common and secret consent, of all wisedome, hitherto hath ben sufficed to remayne: that it might carry with it a perpetuall memorye, of the first and notable benefite, by that Science, to common people shewed: Which was, when Boundes and meeres of land and ground were lost, and confounded (as in *Egypt*, yearly, with the ouerflowing of *Nile*, the greatest and longest riuier in the world) or that ground bequeathed, were to be assigned: or, ground sold, were to be layd out: or (when disorder preuailed) that Common were distributed into feueralties. For, where, vpon these & such like occasions, Some by ignorance, some by negligence, Some by fraude, and some by violence, did wrongfully limite, measure, encroache, or challenge (by

Numbers.

Geometrie.

a.ij. pretence

## John Dee his Mathematicall Præface.

pretence of iust content, and measure) those landes and groundes: great losse, diffiquities, murder, and warre did (full oft) ensue: Till, by Gods mercy, and mans Industrie, The perfect Science of Lines, Plaines, and Solides (like a diuine Iusticier,) gaue vnto euery man, his owne. The people then, by this art pleased, and greatly relieved, in their landes iust measuring: & other Philosophers, writing Rules for land measuring, betweene them both, thus, confirmed the name of *Geometria*, that is, (according to the very etimologie of the word) Land measuring. Wherin, the people knew no farther, of Magnitudes vse, but in Plaines: and the Philosophers, of the, had no feet hearers, or Scholars: farder to disclose vnto, then of flat, plaine *Geometrie*. And though, these Philosophers, knew of farder vse, and best vnderstode the etimologie of the word, yet this name *Geometria*, was of them applyed generally to all sortes of Magnitudes: vnto each, otherwhile, of *Plato*, and *Pythagoras*: When they would precisely declare their owne doctrine. Then, was *Geometria*, with them, *Studium quod circa planum versatur*. But, well you may perceiue by *Euclides Elementes*, that more ample is our Science, then to measure Plaines: and nothing lesse therein is taught (of purpose) then how to measure Land. An other name, therefore, must needs be had, for our Mathematicall Science of Magnitudes: which regardeth neither clod, nor tuffe: neither hill, nor dale: neither earth nor heauen: but is absolute *Metageologia*: not creping on ground, and dasceling the eye, with pole

\**Plato*. 7. de *Rep.*

perche, rod or lyne: but lifting the hart about the heauens, by inuisible lines, and immortal beames: meeteth with the reflexions, of the light incomprehensible: and so procureth Ioye, and perfection vnspicable. Of which true vse of our *Metageologia*, or *Metageologia*, *Diuine Plato* seemed to haue good taste, and iudgement: and (by the name of *Geometrie*) so noted it, and warned his Scholers therof: as, in his seuenth *Dialog*, of the Common wealth, may euidently be seene. Where (in Latin) thus it is: right well translated: *Profecto, nobis hoc non negabunt, Quicquid, vel paululum quid Geometria gustauerunt, quin hac Scientia, centrâ, omnino se habeat, quæ de ea loquuntur, qui in ipsa versantur*. In English, thus. Verely (sayth *Plato*) who soeuer h.ue (but euen very litle) tasted of *Geometrie*, will not denye vnto vs, this: but that this Science, is of an other condition, quite contrary to that, which they that are exercised in it, do speake of it. And there it followeth, of our *Geometrie*, *Quid quæritur cognoscendi illius gratia, quod semper est, non & eius quod erit quandoq; & interit*. *Geometria*, eius quod est semper, Cognitis est. Attollet igitur (ô *Generose vir*) ad Veritatem, animus: atq; ita, ad Philosophandum preparabit cogitationem, et ad iupera conuertamus: quæ, p. n. contra quædam decet, ad inferiora decimus. &c. Quam maxime igitur præcipiendum est, et qui præclarissimam hanc habitât Civitatem, nullo modo, Geometriam spernunt. Nam & quæ præcipiuntur propositum, quodam modo esse videntur, hanc exigua Juni. &c. It must needs be conceiued (sayth *Plato*) That (*Geometria*) is learned, for the knowing of that, which is euer: and not of that, which, in tyme, both is bred and is brought to an ende. &c. *Geometrie* is the knowledge of that which is euerlasting. It will lift vp therefore (O Gentle Syr) our mynde to the Veritie: and by that means, it will prepare the Thought, to the Philosophicall loue of wisedome: that we may turne or conuert, toward heauenly thinges (with mynde and thought) which now, otherwise then becometh vs, we cast down on base or inferior thinges. &c. Chiefly, therefore, Commandement must be giuen, that such as do inhabit this most honorable (itie, by no means, despoise *Geometrie*. For euen those thinges (as in 13. 14.) which, in manner, seeme to be, beside the purpose of *Geometrie*: are of

## John Dee his Mathematicall Præface.

no small importance. &c. And besides the manifold vses of *Geometrie*, in matters appertaining to warre, he addeth more, of second vnpurposed frute, and commodity, arising by *Geometrie*: saying: *Scimus quin etiam, ad Disciplinas omnes facilius per discendas, interiret omnino, attingeret ne Geometria aliquis, an non. &c.* Hanc ergo *Doctrinam*, secundo loco discendum invenimus statuiamus. That is. But, also, we knowe, that for the more easy learning of all Artes, it importeth much, whether one haue any knowledge in *Geometrie* or no. &c. Let vs therefore make an ordinance or decree, that this Science, of young men shall be learned in the second place. This was *Diuine Plato* his Iudgement: both of the purposed, chief, and perfect vse of *Geometrie*: and of his second, depending, deriuatiue commodities. And for vs, Christen men, a thousand thousand mo occasions are, to haue neede of the helpe of *Metageological* Contemplations: wherby, to trayne our Imaginations and Myndes, by litle and litle, to forsake and abandon, the grosse and corruptible Obiectes, of our vrrward senses: and to apprehend, by sure doctrine demonstratiue, Things Mathematicall. And by them, readily to be holpen and conducted to conceiue, discourse, and conclude of things Intellectual, Spirituall, aternall, and such as concerne our Blisse euerlasting: which, otherwise (without Speciall priuiledge of Illumination, or Reuelation fro heauen) No mortal mans wytt (naturally) is habile to reach vnto, or to Compasse. And, verily, by my small Talent (from above) I am habile to proue and testifie, that the littell Text, and order of our diuine Law, Oracles, and Mysteries, require more skill in Numbers, and Magnitudes: then (commonly) the expolitars haue vttered: but rather onely (at the most) so warned: & shewed their own want therein. (To name any, is needeles: and to note the places, is, here, no place: But if I be duly asked, my answer is ready.) And without the littell, Grammaticall, Mathematicall or Naturall verities of such places, by good and certaine Arte, perceived, no Spirituall sense (propre to those places, by Absolute *Theologie*) will thereon depend. No man, therefore, can doute, but toward the atteyning of knowledge incomparable, and Heauenly Wisedome: Mathematicall Speculations, both of Numbers and Magnitudes: are meanes, aydes, and guides: ready, certaine, and necessary. From henceforth, in this my Præface, will I frame my talke, to *Plato* his fugitive Scholars: or, rather, to such, who well can, (and also wil,) vse their vtward senses, to the glory of God, the benefite of their Countrey, and their owne secret contentation, or honest preferment, on this earthly Scaffold. To them, I will orderly recite, describe & declare a great Number of Artes, from our two Mathematicall fontaines, deriued into the fieldes of Nature. Wherby, such Sedes, and Rotes, as lye depe hyd in the groud of Nature, are refreshed, quickened, and prouoked to grow, shote vp, floure, and gree frute, infinite, and incredible. And these Artes, shall be such, as vpon Magnitudes properties do depend, more, then vpon Number. And by good reason we may call them Artes, and Artes Mathematicall deriuatiue: for (at this tyme) I Define An Arte, to be a Methodicall cōplete Doctrinæ, hauing abundancy of sufficient, and peculiar matter to deale with, by the allowance of the Metaphysical Philosopher: the knowledge whereof, to humane state is necessary. And that I account, An Arc Mathematicall deriuatiue, which by Mathematicall demonstratiue Method, in Nūbers, or Magnitudes, ordreth and confirmeth his doctrine, as much & as perfectly, as the matter subiect will admit. And for that,

I. D.  
Herein, I would gladly shoke of the c. thy name, of *Geometrie*.

An Arte.

An Mathematicall Deriuatiue.

a.ij. I entend



## John Dee his Mathematicall Præface.

*A Mechanicien.* I intend to vse the name and proprietie of a *Mechanicien*, otherwise, then (hitherto) it hath ben vfed, I thinke it good, (for distinction sake) to giue you also a brief description, what I meane thereby. A *Mechanicien*, or a *Mechanicall workman* is he, whose skill is, without knowledge of Mathematicall demonstration, perfectly to worke and finishe any sensible worke, by the Mathematicall principall or deriuatiue, demonstrated or demonstrable. Full well I know, that he which inuenteth, or maketh these demonstrations is generally called a *Speculative Mechanicien*: which differeth nothing from a *Mechanicall Mathematician*. So, in respect of diuerse actions, one man may haue the name of fundry artes: as, some tyme, of a Logician, some tymes (in the same matter otherwise handled) of a Rethoricien. Of these trifles, I make, (as now, in respect of my Præface, I small account: to fyle the for the fine handling of subtile curious disputers. In other places, they may commaunde me, to giue good reason: and yet here, I will not be vnreasonable.

First, then, from the puritie, absolutenes, and Immaterialitie of Principall *Geometrie*, is that kinde of *Geometrie* deniued, which vulgarly is counted *Geometrie*: and is the Arte of Measuring sensible magnitudes, their iust quantitates and contentes. This, teacheth to measure, either at hand: and the practicer, to be by the thing Measured: and so, by due applying of Cumpasse, Rule, Squire, Yarde, Ell, Perch, Pole, Line, Gaging rod, (or such like instrument) to the Length, 1. Plaine, or Solide measured, to be certified, either of the length, perimetry, or distance lineall: and this is called, *Arithmetrie*. Or, to be certified of the content of any plaine Superficies: whether it be in ground Surueyed, Borde, or Glasse measured, or such like thing: which measuring, is named *Embodiment*. Or els to vnderstand the Soliditie, and content of any bodily thing: as of Tymber and Stone, or the content of Pits, Ponds, Wells, Vessels, small & great, of all fashions. Where, of Wine, Oyle, Beere, or Ale vessels, &c, the Measuring, commonly, hath a peculiar name: and is called *Gaging*. And the generall name of these Solide measures, is *Stereometrie*. Or els, this vulgar *Geometrie*, hath consideration to teach the practicer, how to measure things, with good distance betwene him and the thing measured: and to vnderstand thereby, either how farre, a thing fene (on land or water) is from the measurer: and this may be called *Applanometrie*. Or, how High or depe, above or vnder the leuel of the measurers standing, any thing is, which is fene 1. on land or water, called *Hypsometrie*. Or, it informeth the measurer, how Broad any thing is, which is in the measurers view: so it be on Land or Water, situated: and may be called *Planimetrie*. Though I vse here to condition, the thing measured, to be on Land, or Water Situated: yet, know for certain, that the fundry heighte of Cloudes, blasing Starres, and of the Mone, may (by these meanes) haue their distances from the earth: and, of the blasing Starres and Mone, the Soliditie (as well as distances) to be measured: But because, neither these things are vulgarly taught: nor of a common practicer ready to be executed: I rather, let such measures be reckoned incident to some of our other Artes, dealing with things on high, more purposely, then this vulgar Land measuring *Geometrie* doth: as in *Peripetie* and *Astronomie*, &c.

Of these Feates (farther applied) is Sprong the Feate of *Geodesie*, or Land Measuring: more cunningly to measure & Suruey Land, Woods, and Waters, a farre off. More cunningly, I say: But God knoweth (hitherto) in these Realmes of England and Ireland (whether through ignorance or fraude, I can not tell, in euery particular) how great wrong and iniurie hath (in my time) bene committed by

## John Dee his Mathematicall Præface.

particular places of dangers, conteyned within the boundes, and Sea coastes described: as, of Quickbarks, Bankes, Pits, Rocks, Races, Countersides, Whorle-pools, &c. This, dealeth with the Element of the water chiefly: as *Geographie* did principally take the Element of the Earths description (with his apperances) to task. And besides this, *Hydrographie*, requieth a particular Register of certaine Landmarkes (where markes may be had) from the sea, well habile to be fixed, in what point of the Seacumpasse they appeare, and what apparent forme, Situation, and bignes they haue, in respect of any dangerous place in the sea, or nere vnto it, assigned: And in all Coastes, what Mone, maketh full Sea: and what way, the Tides and Ebbes, come and go, the *Hydrographer* ought to reorde. The Soundings likewise: and the Chanels wayes: their number, and depths ordinarily, at ebbe and flud, ought the *Hydrographer*, by obseruation and diligence of Measuring, to haue certainly known. And many other pointes, are belonging to perfecte *Hydrographie*, and for to make a *Rutter*, by: of which, I neede not here speake: as of the describing in any place, vpon Globe or Plaine, the 32. pointes of the Compasse, truly: (whereof, (scarily foure, in England, haue right knowledge: by cause, the lines thereof, are no straight lines, nor Circles.) Of making due projection of a Sphere in plaine. Of the Variation of the Compas, from true North: And such like matters (of great importance, all) I leaue to speake of, in this place: by cause, I may feare (al ready) to haue enlarged the boundes, and duty of an *Hydrographer*, much more, then any man (to this day) hath noted, or prescribed. Yet am I well habile to proue, all these things, to appertaine, and also to be proper to the *Hydrographer*. The chief vse and ende of this Art, is the Art of Navigation: but it hath other diuerse vses: euen by them to be enioyed, that neuer lacke sight of land.

*Stratarithmetrie*, is the Skill, (appertaining to the warre,) by which a man can set in figure, analogically to any *Geometrical* figure appointed, any certaine number or summe of men: of such a figure capable: (by reason of the vidual spaces betwene Souldiers allowed: and for that, of men, can be made no Fractions. Yet, neuertheless, he can order the giuen summe of men, for the greatest such figure, that of them, can be ordered) and certifie, of the ouerplus: (if any be) and of the next certaine summe, which, with the ouerplus, will admit a figure exactly proportionall to the figure assigned. By which Skill, also, of any army or company of men: (the figure & sides of whose order standing, or array, is known) he is able to expresse the iust number of men, within that figure contained: or (orderly) able to be contained. \* And this figure, and sides thereof, he is habile to know: either beying by, and at hand: or a farre off. Thus farre, stretcheth the description and property of

*Stratarithmetrie*: sufficient for this tyme and place. It differeth from the Feate of *Tacticall*, *De acibus instruendis*, by cause, there, is necessary the wisdom and fore-sight, to what purpose he so ordereth the men: and Skillfull habilitie, also, for any occasion, or purpose, to deuise and vse the aptest and most necessary order, array and figure of his Company and Summe of men. By figure, I meane: as, either of a *Perfect Square*, *Triangle*, *Circle*, *Ouale*, *long Square*, (of the Grekes it is called *Eteramkes*) *Rhomboid*, *Rhomboid*, *Lunular*, *Ring*, *Serpentine*, and such other *Geometrical* figures: Which, in warres, haue ben, and are to be vsed: for commodiousnes, necessity, and auantage &c. And no small skill ought he to haue, that should make true report, or nere the truth, of the numbers and Summes, of footemen or horsemen, in the Enemyes ordering. A farre off, to make an estimate, betwene nere termes of More and Lesse, is not a thying very rare, among those that gladly would

## John Dee his Mathematicall Præface.

by vntrue measuring and surueying of Land or Woods, any way. And, this I am sure: that the Value of the difference, betwene the truth and such Surueys, would haue bene habile to haue found (for euer) in eche of our two Vniuersities, an excellent Mathematicall Reader: to eche, allowing (yearly) a hundred Markes of lawfull money of this realme: which, in dede, would seme requisite, here, to be had (though by other wayes provided for) as well as, the famous Vniuersitie of Paris, hath two Mathematicall Readers: and eche, two hundred French Crownes yearly, of the French Kinges magnificent liberalitie onely. Now, againe, to our purpose returning: Moreouer, of the former knowledge *Geometrical*, are grown the Skills of *Geographie*, *Chorographie*, *Hydrographie*, and *Stratarithmetrie*.

*Geographie* teacheth wayes, by which, in sudry formes, (as *Spherike*, *Plaine*, or other), the Situation of Cities, Townes, Villages, Fortes, Castells, Mountaines, Woods, Hauens, Riuers, Crekes, & such other things, vpon the outface of the earthly Globe (either in the whole, or in some principall member and portion thereof) may be described and designed, in cōmensurations Analogical to Nature: and veritie: and most aptly to our vew, may be represented. Of this Arte how great pleasure, and how manifold commodities do come vnto vs, daily and hourly: of most men, is perceived. While, some, to beautifie their Halls, Parlours, Chambers, Galleries, Studies, or Libraries with: other some, for things past, as battels fought, earthquakes, heauenly fyringes, & such occurrents, in histories mentioned: thereby liuely, as it were, to vewe the place, the region adjoining, the distance from vs: and such other circumstances. Some other, presently to vewe the large dominion of the Turke: the wide Empire of the Molchoite: and the little morcell of ground, where Christendome (by profession) is certainly known. Little, I say, in respect of the rest, &c. Some, either for their owne iorneyes directing into farre landes: or to vnderstand of other mens traualles. To conclude, some, for one purpose: and some, for an other, lieth, I ouergeth, and vseth, Mappes, Chartes, & *Geographical* Globes. Of whose vse, to speake sufficiently, would require a booke peculiar.

*Chorographie* seemeth to be an vnderling, and a twig, of *Geographie*: and yet neuertheless, is in practise manifolde, and in vse very ample. This teacheth Analogically to describe a small portion or circuite of ground, with the contentes: not regarding what commensuration it hath to the whole, or any parcell, without it, contained. But in the territory or parcell of ground which it taketh in hand to make description of, it leaueth out (or vnderdescribed) no notable, or odde thing, about the ground visible. Yea and sometimes, of things vnder ground, geueth some peculiar marke: or warning: as of Metall mines, Cole pittes, Stone quarries, &c. Thus, a Dukedome, a Shiere, a Lordship, or lesse, may be described distinctly. But marueilous pleasant, and profitable it is, in the exhibiting to our eye, and commensuration, the plat of a Citie, Towne, Forte, or Pallace, in true Symmetry: not approaching to any of them: and out of Gunne shot, &c. Hereby, the *Architect* may furnishe him selfe, with store of what patterns he liketh: to his great instruction: euen in those thinges which outwardly are proportioned: either simply in them selues: or respectiue, to Hillies, Riuers, Hauens, and Woods adjoining. Some also, terme this particular description of places; *Topographie*.

*Hydrographie*, deliuereth to our knowledge, on Globe or in Plaine, the perfect Analogical description of the Ocean Sea coastes, through the whole world: or in the chiefe and principall partes thereof: with the fles and chiefe

## John Dee his Mathematicall Præface.

do it. Great pollicy may be vsed of the Capitaines, (at tymes fete, and in places convenient) as to vse Figures, which make greatest shew, of so many as he hath: and vsing the aduantage of the three kindes of vidual spaces: (betwene footemen or horsemen) to take the largest: or when he would seme to haue few, (beyng many) contrarywise, in Figure, and space. The Herald, Pursuuant, Sergeant Royall, Capitaine, or who fouer is carefull to come nere the truth herein, besides the Iudgement of his expert eye, his skill of Ordering *Tacticall*, the helpe of his *Geometrical* instrument: Ring, or Staffe Astronomical: (commodiously framed for cariage and vse) He may wonderfully helpe him selfe, by perspective Glasses. In which, (I trust) our posterity will proue more skillfull and expert, and to greater purposes, then in these dayes, can (almost) be credited to be possible.

Thus haue I lightly passed ouer the Artificiall Feates, chiefly depending vpon vulgar *Geometrie*: & commonly and generally reckened vnder the name of *Geometrie*. But there are other (very many) *Mathematical* Artes, which, declining from the puritie, simplicite, and Immaterialitie, of our Principall Science of *Magnitudes*: do yet neuertheless vse the great ayde, direction, and Method of the sayd principall Science, and haue propre names, and distinct: both from the Science of *Geometrie*, (from which they are deniued) and one from the other. As *Perspective*, *Astronomie*, *Musike*, *Cosmographie*, *Astrologie*, *Statike*, *Anthropographie*, *Trochilike*, *Helicosophie*, *Pneumatichie*, *Menadrie*, *Hypogeiodie*, *Hydragogie*, *Horometrie*, *Zographie*, *Architecte*, *Navigation*, *Thaumaturgike* and *Archemaltrie*. I thinke it necessary, orderly, of these to giue some peculiar descriptions: and withall, to touch some of their commodious vses, and so to make this Præface, to be a little swete, pleasant Nosegaye for you: to comfort your Spirites, beyng almost out of courage, and in depayre, (through brutish brute) Weenying that *Geometrie*, had but serued for building of an house, or a curious bridge, or the route of Westminster hall, or some witty pretty deuise, or engyn, appropriate to a Carpenter, or a Ioyner &c. That the thing is farre otherwise, then the world, (commonly) to this day, hath demed, by worde and worke, good profe wilbe made.

Among these Artes, by good reason, *Perspective* ought to be had, ere of *Astronomical* Apperances, perfect knowledge can be attained. And by cause of the prerogative of *Light*, beyng the first of Gods Creatures: and the eye, the light of our body, and his Sense most mighty, and his organ most Artificiall and *Geometrical*: At *Perspective*, we will begyn therefore. *Perspective*, is an Art Mathematicall, which demonstrateth the manner, and properties, of all Radiations Direct, Broken, and Reflected. This Description, or Notation, is brief: but it reacheth so farre, as the world is wyde. It concerneth all Creatures, all Actions, and passions, by Emanation of beames performed. Beames, or natural lines, (here) I meane, not of light onely, or of colour (though they, to eye, giue shew, witness, and profe, whereby to ground the Arte vpon) but also of other *Formes*, both *Substantiall*, and *Accidental*, the certaine and determined actiue Radiall emanations. By this Art (omitting to speake of the highest pointes) we may vse our eyes, and the light, with greater pleasure: and perfect Iudgement: both of things, in light seen, & of other: which by like order of Lightes Radiations, worke and produce their effectes. We may be affamed to be ignorant of the cause, why so fundry wayes our eye is deceived, and abused: as, while the eye weeneth a round Globe or Sphere (beyng farre off) to be a flat and plaine Circle, and so likewise iud-

I.D.  
Prouide,  
you will finde  
in hand to performe  
the description of  
this Feate, thereby  
Chorographie, you  
may liuely vnderstand  
the whole nature of  
the same: where the  
Sides and Angles  
are not Regular:  
as, Rhomboid, Rhomboid,  
Lunular, Ring, Serpentine,  
and such like Figures:  
which are not  
described with  
the Geometrical  
and Figures.



## John Dee his Mathematicall Preface.

geth a plaine Square, to be roūd: suppoſeth walls & parallels, to approche, a farre of: rofe and floure parallels, the one to bend downward, the other to riſe vpward, at a little diſtance from you. Againe, of things being in like ſwiftnes of mouing, to thinke the nether, to moue falter, and the farther, much ſlower. Nay, of two things, wherof the one (incomparably) doth moue ſwifter then the other, to deme the ſlower to moue very ſwift, & the other to know the cauſes demonſtratiue, is it not pleaſant, is it not neceſſary: of two or three Sonnes appearing: of Blaſing Sterres: and ſuch like things: by naturall cauſes, brought to paſſe, (and yet neuertheles, of order matter, Significatiue) is it not commodious for man to know the very true cauſe, & occaſion Naturall? Yea, rather, is it not greatly, againſt the Souerainty of Mans nature, to be ſo ouerhot and abuſed, with things (at hand) before his eyes? as with a Peacockes tayle, and a Doues necke: or a whole ore, in water, holden, to ſeme broken. Thynges, farre of, to ſeme nere: and nere, to ſeme farre of. Small things, to ſeme great: and great, to ſeme ſmall. One man, to ſeme an Army. Or a man to be curſily affrayed of his owne ſhadow. Yea, ſo much, to feare, that, if you, being (alone) nere a certaine glaſſe, and proffer, with dagger or ſword, to foynce at the glaſſe, you ſhall ſuddenly be moued to giue backe (in maner) by reaſon of an Image, appearing in the ayre, betwene you & the glaſſe, with like falter, ſword or dagger, & with like quicknes, foyning at your very eye, likewiſe as you do at the Glaſſe. Strange, this is, to heare of: but more meruailous to behold, then theſe my wordes can ſignifie. And neuertheleſſe by demonſtration Opticall, the order and cauſe therof, is certified: euen ſo, as the effect is conſequent. Yea, thus much more, dare I take vpon me, toward the ſatisfying of the noble courage, that longeth ardently for the wiſedome of Cauſes Naturall: as to let him vnderſtand, that, in London, he may with his owne eyes, haue profe of that, which I haue ſayd herein. A Gentleman, (which, for his good ſeruite, done to his Country, is famous and honorable: and for ſkill in the Mathematicall Sciences, and Languages, is the Od man of this land. &c.) euen he, is hable: and I am ſure, will, very willingly, let the Glaſſe, and profe be ſene: and ſo I (here) requelt him: for the encrease of wiſedome, in the honorable: and for the ſtopping of the mouthes malicious: and reſpreſſing the arrogancy of the ignorant. Ye may eaſily geſſe, what I mean. This Art of *Perſpectiue*, is of that excellency, and may be led, to the certifying, and executing of ſuch things, as no man would eaſily beleue: without Actuell perceiued. I ſpeake nothing of *Naturall Philoſophie*, which, without *Perſpectiue*, can not be fully vnderſtanded, nor perfectly attained vnto. Nor, of *Aſtronomie*: which, without *Perſpectiue*, can not well be grounded: Nor *Aſtologie*, naturally Verified, and auouched. That part hereof, which dealeth with Glaſſes (which name, Glaſſe, is a general name, in this Arte, for any thing, from which, a Beame reboundeth) is called *Catoptrike*: and hath ſo many vſes, both meruailous, and profitable: that, both, it would hold me to long, to note therein the principall conſolutions, all ready knowne: And alſo (perchaunce) ſome things, might lacke due credite with you: And I, therby, to leſſe my labor: and you, to ſlip into light Iudgement, Before you haue learned ſufficiently the powre of Nature and Arte.

Now, to procede: *Aſtronomie*, is an Arte Mathematicall, which demonſtrateth the diſtance, magnitudes, and all naturall motions, apparences, and paſſions prope to the Planets and fixed Sterres: for

## John Dee his Mathematicall Preface.

Inuifible Shall we (ſay) looke vpon the Heauen, Sterres, and Planets, as an Oxe and an Aſſe doth: no further carefull or inquisitive, what they are: why were they Created, How do they execute that they were Created for: Seeing, All Creatures, were for our ſake created: and both we, and they, Created, chiefly to glorifie the Almighty Creator: and that, by all means, to vs poſſible. *Noluit ignorare (ſaith Plato in Epinomia) Aſtronomie, ſapientia quiddam eſſe. Be ye not ignorant, Aſtronomie to be a thing of excellent wiſedome.* *Aſtronomie*, was to vs, from the beginning commended, and in maner commanded by God him ſelfe. In aſmuch as he made the *Sonnes*, *Mone*, and *Sterres*, to be to vs, for *Signes*, and knowledge of Seasons, and for Diſtinctions of Days, and yeares. Many wordes neede not. But I wiſh, euery man ſhould way this word, *Signes*. And beſides that, conferre it alſo with the tenth Chapter of *Hieremie*. And though ſome thinke, that there, they haue found a rod: Yet Modeſt Reaſon, will be indifferent Iudge, who ought to be beaten therewith, in reſpect of our purpoſe. Leaving that: I pray you vnderſtand this: that without great diligence of Obſeruation, examination and Calculation, their periods and conſtances (wherby *Diſtinction* of Seasons, yeares, and New Moones might precieſly be knowne) could not exactly be certified. Which thing to performe, is that *Art*, which we here haue Defined to be *Aſtronomie*. Wherby, we may haue the diſtinct Courſe of Times, dayes, yeares, and Ages: as well for Conſideration of Sacred Prophecies, accomplished in due time, foretold: as for high Myſticall Sollemnities holding: And for all other humane affairs, Conditions, and covenantes, vpon certaine time, betwene man and man: with many other great vſes: Wherin, (verely), would be great uncertainty, Confuſion, vntruth, and brutiſh Barbarouſnes: without the wonderfull diligence and ſkill of this Art: continually learning, and determining Times, and periods of Time, by the Record of the heavenly booke, wherin all times are written: and to be read with an *Aſtronomically* Glaſſe, in ſtede of a ſeſtue.

*Muſike*, of Motion, hath his Originall cauſe: Therefore, after the motions moſt ſwift, and moſt Slow, which are in the Firmament, of Nature performed: and vnder the *Aſtronomical* Conſideration: now I will ſpeake of another kinde of Motion, producing ſound, audible, and of Man numerable. *Muſike* I call here that Science, which the Grekes is called *Harmonie*. Not meddling with the Controuerſie betwene the ancient *Harmoniſtes*, and *Catonian*. *Muſike* is a Mathematicall Science, which teacheth, by ſenſe and reaſon, perfectly to iudge, and order the diuerſities of foundes, hye and low. *Aſtronomie* and *Muſike* are ſiſters ſaith Plato. As for *Aſtronomie*, the eyes: So, for *Harmonious Motion*, the eares were made. But as *Aſtronomie* hath a more diuine Contemplation, and conſideration: then mortall eye can perceiue: So, as *Muſike* to be conſidered, that the

1. \* Minde may be preferred, before the eare. And from audible found, we ought to aſcende, to the examination: which numbers are *Harmonious*, and which not. And why, either, the one or the other are not. I could at large, in the heavenly
2. \* motions and diſtances, deſcribe a meruailous *Harmonie*, of *Pythagoras* Harpe with eight ſtringes. Alſo, ſomewhat might be ſayd of *Mercurius* two Harpes, eche of foure ſtringes Elementall.
3. And very ſtrange matter, might be alledged of the *Harmonie*, to our \* Spiritual part appropriate. As in *Ptolomaeus* third boke, in the fourth and ſixth Chapters may appeare. \*
4. \* And what is the cauſe of the apt bondie, and friendly fellowſhip, of the Intellectual and Mental part of vs, with our groſſe & corruptible body: but a certaine Meane, and *Harmonious* *Spiritualitie*, with both

## John Dee his Mathematicall Preface.

any time paſt, preſent and to come: in reſpect of a certaine Horizon, or without reſpect of any Horizon. By this Arte we are certified of the diſtance of the Starry Skye, and of eche Planet from the Centre of the Earth: and of the greatnes of any Fixed ſtarre ſene, or Planet, in reſpect of the Earths greatnes. As, we are ſure (by this Arte) that the Solidity, Maſſines and Body of the *Sonne*, containeth the quantitie of the whole Earth and Sea, a hundred threſcore and two times, leſſe by  $\frac{1}{4}$  one eight parte of the earth. But the Body of the whole earthly globe and Sea, is bigger then the body of the Mone, three and forty times leſſe by  $\frac{1}{4}$  of the Mone. Wherefore the *Sonne* is bigger then the *Mone*, 7000 times, leſſe, by  $\frac{1}{4}$  that is, precieſly 6940  $\frac{1}{4}$  bigger then the *Mone*. And yet the vnſkillfull man, would iudge them a like bigge. Wherefore, of Neceſſity, the one is much farther from vs, then the other. The *Sonne*, when he is fardeſt from the earth (which, now, in our age, is, when he is in the 8. degree, of Cancer), is, 1179 Semidiameters of the Earth, diſtante. And the *Mone* when he is fardeſt from the earth, is 68 Semidiameters of the earth and  $\frac{1}{4}$ . The nereſt, that the *Mone* cometh to the earth, is Semidiameters  $51 \frac{1}{4}$ . The diſtance of the Starry Skye is, frō vs, in Semidiameters of the earth 20081  $\frac{1}{4}$ . Twenty thouſand foureſcore, one, and almoſt a halfe. Subſtra from this, the *Mone* nereſt diſtance, from the Earth: and therof remaineth Semidiameters of the earth 20029  $\frac{1}{4}$ . Twenty thouſand nine and twenty and a quarter. So thicke is the heavenly Palace, that the Planets haue all their exerciſe in, and moſt meruailouſly performe the Commaſſement and Charge to them giuen by the omnipotent Maieſtie of the king of kings. This is that, which in *Genetiſis* is called *Ha Rakia*. Conſider it well. The Semidiameter of the earth, coſtineeth of our common miles 3436  $\frac{1}{4}$  three thouſand, foure hundred thirty ſix and foure eleuenth partes of one myle: Such as the whole earth and Sea, round about, is 21600. One and twenty thouſand fix hundred of our myles. Allowyng for euery degree of the greateſt circle, thre ſcore myles. Now if you way well with your ſelfe but this little parcell of ſtute *Aſtronomically*, as concerning the bigneſſe, Diſtances of *Sonne*, *Mone*, *Starry Skye*, and the huge maſſines of *Ha Rakia*, will you not finde your Conſciences moued, with the kingly Prophet, to ſing the confeſſion of Gods Glory, and ſay, *The Heauens declare the glory of God, and the Firmament (vra vauis) ſheweth forth the workes of his handes*. And ſo forth, for thoſe five firſt ſtaues, of that kingly Pſalme. Well, well, it is time for ſome to lay hold on wiſedome, and to Iudge truly of things: and not to expound the Holy word, all by Allegories: as to Neglect the wiſedome, powre and Goodnes of God, in, and by his Creatures, and Creation to be ſeen and learned. By paraboles and Analogies of whole natures and properties, the courſe of the Holy Scripture, alſo, declareth to vs very many Myſteries. The whole Frame of Gods Creatures, (which is the whole world,) is to vs, a bright glaſſe: from which, by reflexion, reboundeth to our knowledge and perceiurance, Beames, and Radiations: repreſenting the Image of his Infinite goodnes, Omnipotency, and wiſedome. And we therby, are taught and perſuaded to Glorifie our Creator, as God: and be thankfull therfore. Could the Heatheniſtes finde theſe vſes, of theſe moſt pure, beawtiffull, and Mighty Corporall Creatures: and ſhall we, after that the true *Sonne* of rightwiſeneſſe is riſen about the Horizon, of our temporall Hemipſphere, and hath ſo abundantly ſtreamed into our hartes, the direct beames of his goodnes, mercy, and grace: Whoſe hear All Creatures fee: *Spiritual* and Corporall: Viſible and

b.ij. Inui-

## John Dee his Mathematicall Preface.

both participating, & of both (in a manner) reſuſciting in the \* Tune of *Mores* voyce, and alſo \* the ſound of Inſtrument, what might be ſayd, of *Harmonie*: No common Muſicien would lightly beleue. But of the Tundry Mixture (as I may terme it) and conſeque, diuerſe collation, and Application of theſe *Harmonies*: as of thre, foure, five, or mo: Maruailous haue the effects ben: and yet may be founde, and produced the like: with ſome proportionall conſideration for our time, and being: in reſpect of the State, of the things then: in which, and by which, the wondrous effects were wrought. *Democritus* and *Theophrastus* affirmed, that, by *Muſike*, griefes and diſeaſes of the Minde, and body might be cured, or infered. And we finde in Records, that *Tersander*, *Atrion*, *ſonnetus*, *Orpheus*, *Amphion*, *Dauid*, *Pythagoras*, *Empedocles*, *Aſclepiades* and *Timotheus*, by *Harmonical* Conſonancy haue done, and brought to paſſe, things, more then meruailous, to here of. Of them then, making no farther diſcourſe, in this place: Sure I am, that Common *Muſike*, commonly vſed, is found to the *Muſiciens* and Hearers, to be ſo Commodious and pleaſant, That if I would lay and diſpute, but thus much: That it were to be otherwiſe vſed, then it is, I ſhould finde more repreuers, then I could finde priuy, or ſkillfull of my meaning. In things therfore euident, and better knowne, then I can expreſſe: and ſo allowed and liked of, (as I would wiſh, ſome other things, had the like hap) I will pray to enlarge my lines any farther, but conſequently follow my purpoſe.

Of *Cosmographie*, I appointed briefly in this place, to geue you ſome intelligence. *Cosmographie*, is the whole and perfect deſcription of the heavenly, and alſo elementall parte of the world, and their homologall application, and mutuall collation neceſſarie. This Art, requieth *Aſtronomie*, *Geographie*, *Hydrographie* and *Muſike*. Therefore, it is no ſmall Arte, nor ſo ſimple, as in common praſtice, it is (ſlightly) conſidered. This matcheth Heauen, and the Earth, in one frame, and aptly applyeth parts Correſpondent: So, as, the Heavenly Globe, may (in praſtice) be duely deſcribed vpon the Geographicall, and Hydrographicall Globe. And there, for vs, to conſider an *Aquiductall Circle*, an *Equiſideline*, *Calures*, *Poles*, *Sterres* in their true Longitudes, Latitudes, Declinations, and Verticalitie: alſo Climes, and Parallels: and by an *Horizon*, carried about in 24. equal Hours) to learne the Riſings and Settings of Sterres (of *Virgill* in his *Georgicks*: of *Hefiod*: of *Hippocrates* in his *Medicinal Sphere*, to *Perdicca* King of the Macedonians: of *Dionis*, to King *Antigonos*, and of other famous *Philophers* preſcribed) a thing neceſſary, for due manuring of the earth, for *Navigation*, for the Alteration of mans body: being, whole, Sicke, wounded, or baſed. By the Revolution, alſo, or mouing of the Globe *Cosmographically*, the Riſing and Setting of the Sonne: the Lengthes, of dayes and nights: the Hours and times (both night and day) are knowne: with very many other pleaſant and neceſſary vſes: Wherof, ſome are knowne: but better remaine, for ſuch to know and vſe: who of a ſpark of true fire, can make a wonderfull bonfire, by applying of due matter, duely.

Of *Aitologie*, here I make an Arte, ſeueral from *Aſtronomie*: as not by new deuſe, but by good reaſon and authoritie: for, *Aitologie*, is an Arte Mathematicall, which reaſonably demonſtrateth the operations and effects, of the naturall beames, of light, and ſecret influence: of the Sterres and Planets: in euery element and elementall body:

b.iii. at



## John Dee his Mathematicall Præface.

at all times, in any Horizon assigned. This Arte is furnished with many other great Artes and experiences: As with perfect *Perfettue, Astronomie, Cosmographie, Naturall Philosophie* of the 4. Elementes, the Arte of Graduation, and some good vnderstanding in *Musike*: and yet moreover, with an other great Arte, hereafter following, though I, here, let this before, for some considerations me mouing. Sufficient (you see) is the stuffe, to make this rare and secrete Arte, of: and hard enough to frame to the Conclusion Syllogisticall. Yet both the manifold and continuall trauailes of the most auncient and wise Philosophers, for the attaining of this Arte: and by examples of effectes, to confirme the same: hath left vnto vs sufficient proufe and witnesse: and we also, daily may perceiue, That mans body, and all other Elementall bodies, are altered, disposed, ordred, pleased, and displeased, by the Influentiall working of the *Sunne, Mone*, and the other Starres and Planets. And therefore, sayth *Aristotle*, in the first of his *Meteorologicall* bookes, in the second Chapter: *Est autem necessarius Mundus iste, superius latens in se ferè continuus. Et, inde, vis eius vniuersa regatur. Ea liquidem Causa prima potanda omnibus est, vnde motus principium exiit.* That is: This *Elementall* World is of necessity, almost, next adioyning, to the heavenly motions: That, from thence, all his vertue or force may be governed. For, that is to be thought the first Cause vnto all: from which, the beginning of motion, is. And againe, in the tenth Chapter: *Operes igitur et horum principia sumamus, & causas omnium similes. Principium igitur et motus præcipuum, & omnium primum, Circulus ille est, in quo manifeste Solis latet, &c.* And so forth. His *Meteorologicall* bookes, are full of argumentes, and effectuall demonstrations, of the vertue, operation, and power of the heavenly bodies, in and vpon the fower Elementes, and other bodies, of them (either perfectly, or vnto perfectly) composed. And in his second booke, *De Generatione & Corruptione*, in the tenth Chapter: *Quæ circa & prima latet, Ortus & Intus causa non est: Sed obliqui Circuli latet: ea namq; & continua est, & duobus modis fit.* In English, thus. *Wherefore the uppermost motion, is not the cause of Generation and Corruption, but the motion of the Zodiacke: for, that, both, is continuall, and is caused of two mouinges.* And in his second booke, and second Chapter of his *Physike*. *Homo namq; generat hominem, atq; Sol. For Man* (sayth he) *and the Sonne, are cause of mans generation.* Authorities may be brought, very many: both of 1000. 2000. yea and 3000. yeates Antiquite: of great *Philosophers, Experts, Wise*, and godly men, for that Conclusion: which, daily and hourly, we men, may discern and perceiue by sense and reason: All beastes do feele, and simply they, by their actions and passions, outward and inward: All Plants, Herbes, Trees, Flowers, and Fruites. And finally, the Elementes, and all thinges of the Elementes composed, do geue Testimonie (as *Aristotle* sayd) that they *Whole Dispositions, vertues, and naturall motions, depend of the Actiuitie of the heavenly motions and Influences. Whereby, beside the specificall order and forme, due to every seede: and beside the Nature, propre to the Individuall Matrix, of the thing produced: What shall be the heavenly Impression, the perfect and circumspetie Astrologien hath to Conclude.* Not onely (by *Apostolines*) *in vi*, burthly *Naturall* and *Mathematicall* demonstration *in diuina*. Whereunto, what Sciences are requisite (without exception) I partly haue here warned: And in my *Propædæumet* (besides other matter there disclosed) I haue Mathematicallly furnished vnto the whole Method: To this our age, not so carefully handled by any, that

## John Dee his Mathematicall Præface.

cuer I saw, or heard of. I was, (for \* 21. yeares ago) by certaine earnest disputations, of the Learned *Gerardus Mercator, and Antonius Gergas*, (and other,) thereto so prouoked: and (by my constant and inuincible zeale to the veritie) in obseruations of Heauenly Influences (to the Minute of time,) than, so diligent: And chiefly by the Supernaturall influence, from the Starre of Iacob, so directed: That any Modest and Sober Student, carefully and diligently sifting for the Truth, will both finde & cōfesse, therein, to be the Veritie, of these my wordes: And also become a Reasonable Reformer, of three Sortes of people: about these Influentiall Operations, greatly erring from the truth. Wherof, the one, is *Light Belueers*, the other, *Light Despisers* and the third *Light Practisers*. The first, & most cōmon Sort, thinke the Heauen and Sterres, to be answerable to any their doubts or desires: which is not so: and, in dede, they, to much, ouer reache. The Second sorte thinke no Influentiall vertue (frō the heauenly bodies) to beare any Sway in Generation and Corruption, in this Elementall world. And to the *Sunne, Mone* and *Sterres* (being so many, so pure, so bright, so wonderfull bigge, so farre in distance, so manifold in their motions, so constant in their periedes. &c.) they assigne a sleight, simple office or two, and so allow vnto the (according to their capacities) as much vertue, and power Influentiall, as to the Signe of the *Sunne, Mone*, and fewen Sterres, hangd vp (for Signes) in London, for distinction of houses, & such grosse helpes, in our worldly affaires: And they vnderstand not (or will not vnderstand) of the other workings, and vertues of the Heauenly *Sunne, Mone*, and *Sterres*: not so much, as the Mariner, or Husband man: no, not so much, as the *Elephant* doth, as the *Cynocephalus*, as the *Porpentine* doth: nor will allow these perfect, and incorruptible mighty bodies, so much vertuell Radiation, & Force, as they see in a litle peece of a *Magnetis* stone: which, at great distance, sheweth his operation. And perchance they thinke, the Sea & Riues (as the Thames) to be some quicke thing, and so to ebbe, and flow, run in and out, of them selues, at their owne fantasies. God helpe, God helpe. Surely, these men, come to short: and either are to dull: or willfully blind: or, perhaps, to malicious. The third man, is the common and vulgar *Astrologien*, or Practiser: who, being not duly, artificially, and perfectly furnished, yet, either for vaine glory, or gayne: or like a simple, dolt, & blinde Bayard, both in matter and maner, erreth to the discredit of the *Wary*, and modest *Astrologien*: and to the robbing of those most noble corporall Creatures, of their Naturall Vertue: being most mighty: most beneficiall to all elementall Generation, Corruption and the appertanances: and most Harmonious in their Monarchie: For which thinges, being knowne, and modestly vsed: we might highly, and continually glorifie God, with the princely Prophet, saying. *The Heauen declares the Glorie of God: who made the Heaues in his wisdom: who made the Sonne, for to haue dominion of the day: the Mone and Sterres to haue dominion of the night: whereby, Day to day uttereth talke: and night, to night declareth knowledge. Praise him, all ye Sterres and Light. Amen.*

In order, now foloweth, of *Statike*, somewhat to say, what we meane by that name: and what commodity, doth, on such Art, depend. *Statike*, is an Arte Mathematicall, which demonstrateth the causes of heauynes, and lightnes of all thynges: and of motions and properties, to heauynes and lightnes, belonging. And for asmuch as, by the *Balanx*, or *Balace* (as the chieff sensible Instrument,) Experience of these demonstrations may

\* Anno. 1548  
and 1549. in  
Lancyn.

Note.

1.

2.

3.

b.iii. be

## John Dee his Mathematicall Præface.

be had: we call this Art, *Statike*: that is, the *Experimentes of the Balance*. Oh, that men wist, what profit, (all manner of wayes) by this Arte might grow, to the habile examiner, and diligent practiser. Thou onely knowest all thinges precisely (O God) who hast made weight and Balance, thy Iudgement: who hast created all thinges in *Number, Weight, and Measure*: and hast wayed the mountaines and hills in a *Balanx*: who hast peyld in thy hand, both Heauen and earth. We therefore warned by the Sacred word, to Consider thy Creatures: and by that consideration, to wyne a glyms (as it were,) or shadow of perceiurance, that thy wisdom, might, and goodnes is infinite, and vnspakable, in thy Creatures declared: And being farther aduertised, by thy mercifull wayes, that three principall wayes, were, of the vied in Creation of all thy Creatures, namely, *Number, Weight* and *Measure*. And for as much as, of *Number and Measure*, the two Artes (auncient, famous, and to humane vses most necessary,) are all ready, sufficiently knowne and extant: This third key, we beseeche thee (through thy accustomed goodnes,) that it may come to the needfull and sufficient knowledge, of such thy Seruauntes, as in thy workmanship, would gladly finde, thy true occasions (purposely of the vied) whereby we should glorifie thy name, and shew forth (to the weaklings in faith) thy wondrous wisdom and Goodnes. Amen.

Merruile nothing at this pang (godly friend, you Gentle and zelous Student.) An other day, perchance you will perceiue, what occasion moued me. Here, as now, I will giue you some ground, and withall some shew, of certaine commodities, by this Arte arising. And by cause this Arte is rare, my wordes and practises might be to darke: vnlesst you had some light, holden before the matter: and that, both will be in giuing you, out of *Archimedes* demonstrations, a few principal Conclusions, as foloweth.

1.

The Superficies of euery Liquor, by it selfe consifting, and in quyet, is Sphericall: the centre whereof, is the same, which is the centre of the Earth.

2.

If Solide Magnitudes, being of the same bignes, or quaitie, that any Liquor is, and hauing also the same Waight: be let downe into the same Liquor, they will settle downeward, so, that no parte of them, shall be aboue the Superficies of the Liquor: and yet neuer theles, they will not sinke vnto the bottom, or downe.

3.

If any Solide Magnitude being Lighter then a Liquor, be let downe into the same Liquor, it will settle downe, so farre into the same Liquor, that so great a quantitie of that Liquor, as is the parte of the Solide Magnitude, settled downe into the same Liquor: is in Waight, aequall, to the waight of the whole Solide Magnitude.

4.

Any Solide Magnitude, Lighter then a Liquor, forced downe into

## John Dee his Mathematicall Præface.

into the same Liquor, will moue vpward, with so great a power, by how much, the Liquor hauing aequall quantitie to the whole Magnitude, is heauyer then the same Magnitude.

5.

Any Solide Magnitude, heauyer then a Liquor, beyng let do wne into the same Liquor, will sinke downe vnto the bottom: And wilbe in that Liquor, Lighter by so much, as is the waight or heauynes of the Liquor, hauing bygnes or quantitie, aequall to the Solide Magnitude.

6.

If any Solide Magnitude, Lighter then a Liquor, be let downe into the same Liquor, the waight of the same Magnitude, will be to the Waight of the Liquor. (Which is aequall in quantitie to the whole Magnitude,) in that proportion, that the parte, of the Magnitude settled downe, is to the whole Magnitude.

BY these verities, great Errors may be reformed, in Opinion of the Naturall Motion of thinges, Light and Heauy. Which errors, are in Naturall Philosophie (almost) of all me allowed: to much trusting to Authority and false Suppositions. As, Of any two bodies, the heauyer, to moue downward faster then the lighter. This error, is not first by me, Noted: but by one *Iohn Baptista de Benedictis*. The chief of his propositions, is this: which seemeth a Paradox.

If there be two bodies of one forme, and of one kynde, aequall in quantitie or vnacquall, they will moue by aequall space, in aequall tyme: So that both they mouynges be in aye, or both in water: or in any one Middle.

Hereupon, in the state of Gunnyng, certaine good discourses (otherwise) may receiue great amendment, and furderance. In the intended purpose, allos allowing somewhat to the imperfection of Nature: not answerable to the precisenes of demonstration. Moreover, by the foresaid propositions (wisely vied,) The Aye, the water, the Earth, the Fire, may be nieriely known, how light or heauy they are (Naturall) in their assigned partes: or in the whole. And then to thinges Elementall, turning your practise: you may deale for the proportion of the Elementes, in the thinges Compounded. Then, to the proportions of the Humours in Man: their waights: and the waight of his bones, and flesh. &c. Than, by waight, to haue consideration of the Force of man, any manner of way: in whole or in part. Then, may you, of Ships water drawing, chiefly, in the Sea and in fresh water, haue pleasant consideration: and of waying vp of any thing, sinken in Sea or in fresh water. &c. And (to lift vp your head a loft:) by waight, you may, as precisely, as by any instrument els, measure the Diameters of *Sonne* and *Mone*. &c. Frende, I pray you, way these thinges, with the iust Balance of Reason. And you will finde Meruailes vpon Meruailes: And esseme one Drop of Truth (yea in Naturall Philosophie) more worth, then whole Libraries of Opinions, vnder demonstration: or not answering to Natures Law, and your experience. Leaving these thinges,

The Carrying of a Solide aequall to the proportion of the weight, may be more effectually as compared to the weight of the whole Magnitude.

A common error noted.

A paradox.

N. T. The wonderfull use of these Propositions.

cj.



## John Dee his Mathematicall Preface.

The preface  
Statistical, to  
know the pro-  
portion, be-  
tweene the  
Cube, and the  
Sphere.

I. D.  
For, so, have  
you, 256.  
partes of a  
Graine.

The proportion  
of the Sphere  
to the Cube.

The proportion  
of the Sphere  
to the Cube.

\* Vitruvius.  
Lib. 2. Cap. 3.  
God be thank-  
ed for this  
Invention, &  
the faire use  
made.  
\* Note.

Note, as con-  
cerning the  
Sphere, all  
Superficies of  
the water.

Note, this A-  
bridgement of  
Doubling the  
Cube, &c.

things, thus: I will give you two or three, light practises, to great purpose: and so finish my Annotation Statisticall. In Mathematicall matters, by the Mechaniciens ayde, we will behold, here, the Commodity of waight. Make a Cube, of any one Vniforme: and through like heavy stuffe: of the same Stuffe, make a Sphere or Globe, precisely, of a Diameter aequall to the Radicall side of the Cube. Your stuffe, may be wood, Copper, Tinne, Lead, Siluer, &c. (being, as I sayd, of like nature, condition, and like waight throughout.) And you may, by Say Balance, haue prepared a great number of the finallest waightes: which, by thofe Balance can be discerned or tryed: and so, haue proceeded to make you a perfect Pyle, company & Number of waightes: to the waight of fix, eight, or twelue pound waight: most diligently tryed, all. And of euery one, the Content known, in your least waight, that is wayable. They that can not haue these waightes of precisenes: may, by Sand, Vniforme, and well dusted, make them a number of waightes, somewhat nere precisenes: by halving cuer the Sand: they shall, at length, come to a least common waight. Therein, I leave the farder matter, to their discretion, whom nede shall pinche. The Venetian consideration of waight, may seme precise enough: by eight descentes professionall, \* halving, from a grayne. Your Cube, Sphere, apt Balance, and conuenient waightes, being ready: fall to worke. As. First, way your Cube. Note the Number of the waight. Way, after that, your Sphere. Note likewise, the Nuber of the waight. If you now find the waight of your Cube, to be to the waight of the Sphere, as 21. is to 11: Then you see, how the Mechanicien and Experimentall, without Geometric and Demonstration, are (as nerely in effect) taught the proportion of the Cube to the Sphere: as I haue demonstrated it, in the end of the twelfth booke of Euclide. Often, try with the same Cube and Sphere. Then, change, your Sphere and Cube, to an other matter: or to an other bignes: till you haue made a perfect vniuersall Experience of it. Possible it is, that you shall wyne to nerer termes, in the proportion.

When you haue found this one certaine Drop of Naturall veritie, proceede on, to Inferre, and duly to make affay, of matter depending. As, by cause it is well demonstrated, that a Cylinder, whose heith, and Diameter of his base, is aequall to the Diameter of the Sphere, is Sequialter to the same Sphere (that is, as 3. to 2.) To the number of the waight of the Sphere, adde halfe so much, as it is: and so haue you the number of the waight of that Cylinder. Which is also Comprehended of our former Cube: So, that the base of that Cylinder, is a Circle described in the Square, which is the base of our Cube. But the Cube and the Cylinder, being both of one heith, haue their Bases in the same proportion, in the which, they are, one to an other, in their Massines or Solidities. But, before, we haue two numbers, expressing their Massines, Solidities, and Quantities, by waight: wherefore, we haue \* the proportion of the Square, to the Circle, inscribed in the same Square. And so we are fallen into the knowledge sensible, and Experimentall of Archimedes great Secret: of him, by great trauaile of minde, fought and found. Wherefore, to any Circle giuen, you can giue a Square aequall: \* as I haue taught, in my Annotation, upon the first proposition of the twelfth booke. And likewise, to any Square giuen, you may giue a Circle aequall: \* If you describe a Circle, which shall be in that proportion, to your Circle inscribed, as the Square is to the same Circle: This, you may do, by my Annotations, upon the second proposition of the twelfth booke of Euclide, in my third Probleme there. Your diligence may come to a proportion, of the Square to the Circle inscribed, nerer the truth, then is the proportion of 14. to 11. And consider, that you may begin at the Circle and Square, and so come to conclude of the Sphere, & the Cube, what their

## John Dee his Mathematicall Preface.

wayes you may conclude your purpose: it is to wete, either by numbers or lines. By numbers: as if you diuide the side of your Fundamentall Cube into so many aequall partes, as it is capable of, conueniently, with your ease, and precisenes of the diuision. For, as the number of your first and lesse line (in your hollow Pyramis or Cone), is to the second or greater (both being counted from the vertex) so shall the number of the side of your Fundamentall Cube, be to the nuber belonging to the Radicall side, of the Cube, double to your Fundamentall Cube: Which being multiplied Cubick wise, will shew it selfe, whether it be double or no, to the Cubick number of your Fundamentall Cube. By lines, thus: As your lesse and first line, (in your hollow Pyramis or Cone), is to the second or greater, so let the Radicall side of your Fundamentall Cube, be to a fourth proportionall line, by the 12. proposition, of the sixth booke of Euclide. Which fourth line, shall be the Rote Cubick, or Radicall side of the Cube, double to your Fundamentall Cube: which is the thing we desired. For this, may I (with ioy) say, ΕΥΧΗΚΑ, ΕΥΧΗΚΑ, thanking the holy and glorious Trinity: hauing greater cause therto, then \* Archimides had (for finding the fraude vsid in the Kinges Crowne, of Gold): as all men may easily Iudge: by the diuinitie of the frute following of the one, and the other. Where I spake before, of a hollow Cubick Coffin: the like vfe is of it: and without waight. Thus, fill it with water, precisely full, and poure that water into your Pyramis or Cone. And here note the lines cutting in your Pyramis or Cone. Again, fill your Coffin like as you did before. Put that Water, also, to the first. Marke the second cutting of your lines. Now, as you proceeded before, so must you here procede. \* And if the Cube, which you should Double, be neuer so great: you haue, thus, the proportion (in small) between your two little Cubes: And then, the side, of that great Cube (to be doubled) being the third, will haue the fourth, found, to it proportionall: by the 12. of the sixth of Euclide.

Note, that all this while, I forget not my first Proposition Statisticall, here rehearsed: that, the Superficies of the water, is Spherical. Wherein, vfe your discretion: to the first line, adding a small heare breadth, more: and to the second, halfe a heare breadth more, to his length. For, you will easily perceiue, that the difference can be no greater, in any Pyramis or Cone, of you to be handled. Which you shall thus trye. For finding the feeling of the water alone leuell. Square the Semidiameter, from the Centre of the earth, to your first Waters Superficies. Square then, halfe the Subtendent of that watry Superficies (which Subtendent must haue the equal partes of his measure, all one, with those of the Semidiameter of the earth to your watry Superficies): Subtracte this square, from the first: Of the residue, take the Rote Square. That Rote, Subtracte from your first Semidiameter of the earth to your watry Superficies: that, which remaineth, is the heith of the water, in the middle, aboue the leuell. Which, you will finde, to be a thing insensible. And though it were greatly sensible, yet, by helpe of my fix Theoreme upon the Last Proposition of Euclides twelfth booke, noted: you may reduce all, to a true Leuell. But, farther diligence, of you is to be vsed, against accidentall causes of the waters swelling: as by hauing (somewhat) with a moylt Sponge, before, made moylt your hollow Pyramis or Cone, will prevent an accidentall cause of Swelling, &c. Experience will teach you abundantly: with great ease, pleasure, and comoditie.

Thus, may you Double the Cube Mechanically, Treble it, and so forth, in any proportion. Now will I Abridge your paine, cost, and Care herein. Without all preparing of your Fundamentall Cubes: you may (alike) worke this Conclusion. For, that, was rather a kinde of Experimentall demonstration, then the shortest way:

## John Dee his Mathematicall Preface.

their proposition is: as now, you came from the Sphere to the Circle. For, of Siluer, or Gold, or Latton Lamyns or plates (thorough one hole drawe, as the manner is) if you make a Square figure: & way it and then, describing thereon, the Circle inscribed: & cut of, & file away, precisely (to the Circle) the ouerplus of the Square: you shall then, waying your Circle, see, whether the waight of the Square, be to your Circle, as 14. to 11. As I haue Noted, in the beginning of Euclides twelfth booke, &c. after this resort to my last proposition, upon the last of the twelfth. And there, helpe your selfe, to the end. And, here, Note this, by the way. That we may Square the Circle, without hauing knowledge of the proportion, of the Circumference to the Diameter: as you haue here perceiued. And otherwayes also, I can demonstrate it. So that, many haue cumberd them selues superfluously, by trauailing in that point first, which was not of necessity, first: and also very intricate. And easily, you may, (and that diuersly) come to the knowledge of the Circumference: the Circles Quantitie, being first known. Which thing, I leave to your consideration: making halt to despatch an other Magistrall Probleme: and to bring it, nerer to your knowledge, and readier dealing with, then the world (before this day, had it for you, that I can tell of. And that is, A Mechanicall Doubbling of the Cube, &c. Which may, thus, be done: Make of Copper plates, or Tyn plates, a four square vpriht Pyramis, or a Cone: perfectly fashioned in the hollow, within. Wherin, let great diligence be vsed, to approche (as nere as may be) to the Mathematicall perfection of thofe figures. At their bases, let them be all open: euery where, els, most close, and iust to. From the vertex, to the Circumference of the base of the Cone: & to the sides of the base of the Pyramis: Let 4. straight lines be drawn, in the inside of the Cone and Pyramis: making at their fall, on the perimeters of the bases, equal angles on both sides them selues, with the sayd perimeters. These 4. lines (in the Pyramis: and as many, in the Cone) diuide: one, in 12. aequall partes: and an other, in 24. an other, in 60, and an other, in 100. (reckenyng vp from the vertex.) Or vfe other numbers of diuision, as experience shall teach you. Then, fet your Cone or Pyramis, with the vertex downward, perpendicularly, in respect of the Base. (Though it be otherwayes, it hindreth nothing.) So let the most stedily be stayed. Now, if there be a Cube, which you would haue Doubled. Make you a prety Cube of Copper, Siluer, Lead, Tynne, Wood, Stone, or Bone. Or els make a hollow Cube, or Cubick Coffin, of Copper, Siluer, Tynne, or Wood &c. These you may so proportion in respect of your Pyramis or Cone, that the Pyramis or Cone, will be able to containe the waight of them, in water, 3. or 4. times at the least: what fluffe ouer they be made of. Let not your Solid angle, at the vertex, be so sharpe: but that the water may come with ease, to the very vertex, of your hollow Cone or Pyramis. Put one of your Solid Cubes in a Balance aparte: take the waight therof exactly in water. Poure that water, (without losse) into the hollow Pyramis or Cone, quietly. Marke in your lines, what numbers the water Cutteth: Take the waight of the same Cube againe: in the same kinde of water, which you had before: put that also, into the Pyramis or Cone, where you did put the first. Marke now againe, in what number or place of the lines, the water Cutteth them. Two

Note  
Squaring of  
the Circle  
without know-  
ledge of the  
proportion be-  
tweene Cir-  
cumference  
and Diamete-  
ter.

To Double  
the Cube, re-  
adily by Art  
Mechanicall:  
depending up-  
pon Demon-  
stration Ma-  
thematicall.

I. D.  
The side of this  
Pyramid must be  
divided into 12.  
equal parts.

I. D.  
If all you haue  
ready the Pyra-  
mis or Cone, let  
the water be in  
the hollow, and  
the water will  
about you, as  
you will see.

I. D.  
A Cubick will  
when you put  
it into the Pyra-  
mis or Cone, it  
will sink, and  
the water will  
about you, as  
you will see.

Note. E

To giue Cubes  
one to the other,  
in any proporti-  
on, is the theo-  
rem, that any  
proportion, of  
Rational or  
Irrational.

\* Empty-  
ing the  
first.

The demonstration  
of this Doubling  
of the Cube, is of  
the nature of the  
proof.

I. D.  
The demonstration  
of this Doubling  
of the Cube, is of  
the nature of the  
proof.

\* By the side of a  
square, the side  
of the Cube, is  
found.

## John Dee his Mathematicall Preface.

and all, upon one Mathematicall Demonstration depending. Take water (as much as conueniently will serue your turne: as I warned before of your Fundamentall Cubes bignes) Way it precisely. Put that water, into your Pyramis or Cone. Of the same kinde of water, then take againe, the same waight you had before: put that likewise into the Pyramis or Cone. For, in eche time, your marking of the lines, how the Water doth cut them, shall geue you the proportion between the Radicall sides, of any two Cubes, whereof the one is Double to the other: working as before I haue taught you: \* fauing that for your Fundamentall Cube his Radicall side: here, you may take a right line, at pleasure.

Yet farther proceeding with our droppe of Naturall truth: you may (now) geue Cubes, one to the other, in any proportion geue: Rational or Irrational: on this manner. Make a hollow Parallelipipedon of Copper or Tinne: with one Base witing, or open: as in our Cubick Coffin. Fro the bottom of that Parallelipipedon, raise vp, many perpendiculars, in euery of his fower sides. Now if any proportion be assigned you, in right lines: Cut one of your perpendiculars (or a line equal to it, or lesse then it) likewise: by the 10. of the sixth of Euclide. And those two partes, set in two sundry lines of those perpendiculars (or you may set them both, in one line) making their begininges, to be, at the base: and so their lengths to extend vpward. Now, fet your hollow Parallelipipedon, vpriht, perpendicularly, steadie. Poure in water, handsonly, to the heith of your shorter line. Poure that water, into the hollow Pyramis or Cone. Marke the place of the rising. Settle your hollow Parallelipipedon againe. Poure water into it: vnto the heith of the second line, exactly. Poure that water \* duly into the hollow Pyramis or Cone: Marke now againe, where the water cutteth the same line which you marked before. For, there, as the first marked line, is to the second: So shall the two Radicall sides be, one to the other, of any two Cubes: which, in their Solidities, shall haue the same proportion, which was at the first assigned: were it Rational or Irrational.

Thus, in sundry wayes you may furnish your selfe with such strange and profitable matter: which, long hath bene wished for. And though it be Naturally done and Mechanically: yet hath it a good Demonstration Mathematicall. Which is this: Alwayes, you haue two Like Pyramids: or two Like Cones, in the proportion assigned: and like Pyramids or Cones, are in proportion, one to the other, in the proportion of their Homologall sides (or lines) multiplied. Wherefore, if to the first, and second lines, found in your hollow Pyramis or Cone, you ioyne a third and a fourth, in continuall proportion: that fourth line, shall be to the first, as the greater Pyramis or Cone, is to the lesse: by the 33. of the eleuenth of Euclide. If Pyramis to Pyramis, or Cone to Cone, be double, then shall \* Line to Line, be also double, &c. But, as our first line, is to the second, so is the Radicall side of our Fundamentall Cube, to the Radicall side of the Cube to be made, or to be doubled: and therefore, to those twaine also, a third and a fourth line, in continuall proportion, ioynd: will geue the fourth line in that proportion to the first, as our fourth Pyramidall, or Conike line, was to his first: but that was double, or treble, &c. as the Pyramids or Cones were, one to an other (as we haue proued) therefore, this fourth, shall also double or treble to the first: as the Pyramids or Cones were one to an other: But our made Cube, is described of the second in proportion, of the fower proportionall lines: therefore \* as the fourth line, is to the first, so is that Cube, to the first Cube: and we haue proued the fourth line, to be to the first, as the Pyramis or Cone, is to the Pyramis or Cone: Wherefore the Cube is

clij. to the



## John Dee his Mathematicall Preface.

to the Cube, as Pyramis is to Pyramis, or Cone is to Cone. But we<sup>7.23</sup> Suppose Pyramis to Pyramis, or Cone to Cone, to be double or treble, &c. Therefore Cube, is to Cube, double, or treble, &c. Which was to be demonstrated. And of the Parallelepipedon, it is euident, that the water Solide Parallelepipedons, are one to the other, as their heithes are, being they have one base. Wherefore the Pyramids or Cones, made of those water Parallelepipedons, are one to the other, as the lines are (one to the other) betwene which, our proportion was assigned. But the Cubes made of lines, after the proportion of the Pyramidal or Conik homologall lines, are one to the other, as the Pyramids or Cones are, one to the other (as we before did proue) therefore, the Cubes made, shall be one to the other, as the lines assigned, are one to the other: Which was to be demonstrated. Note. \*This, my Demonstratio is more generally, then only in Square Pyramis or Cone: Consider well. Thus, haue I, both Mathematicall and Mechanically, ben very long in wordes: yet I trust nothing tedious to them, who, to these things, are well affected. And verily I am forced (auoiding prolixity) to omit sundry such things, easie to be practised: which to the Mathematician, would be a great Threasure: and to the Mechanician, no final gaine. Now may you, Betwene two lines given, finde two middle proportionals, in Continual proportion: by the hollow Parallelepipedon, and the hollow Pyramis, or Cone. Now any Parallelepipedon rectangle being given: the right lines may be found, proportionall in any proportion assigned, of which, shall be produced a Parallelepipedon, asquall to the Parallelepipedon given. Hereof, I noted somewhat, vpon the 36. proposition, of the 11. booke of *Euclide*. Now, all those things, which *Pitruuius* in his Architecture, specified hable to be done, by doubling of the Cube: Or, by finding of two middle proportionall lines, betwene two lines given, may easily be performed. Now, that Probleme, which I noted vnto you, in the end of my Addition, vpon the 34. of the 11. booke of *Euclide*, is proued possible. Now, may any regular body, be Transformed into an other, &c. Now, any regular body: any Sphere, yea any Mixt Solid: and (that more is) Irregular Solides, may be made (in any proportion assigned) like vnto the body, first given. Thus, of *Manneken*, (as the Dutch Painters terme it) in the same Symmetrie, may a Giant be made: and that, with any gesture, by the Manneken vsed: and contrarywise. Now, may you, of any Mould, or Modell of a Ship, make one, of the same Mould (in any assigned proportion) bigger or lesser. Now, may you, of any Gunne, or little peece of ordinaunce, make an other, with the same Symmetrie (in all points) as great, and as little, as you will. Marke that: and thinke on it. Infinitely, may you apply this, so long sought for, and now so easily concluded: and withall, so willingly and frankly communicated to such, as faithfully deale with vertuous studies. Thus, can the Mathematicall minde, deale Speculatively in his own Arte: and by good means, Mount about the cloudes and ferres: And thirdly, he can, by order, Descend, to frame Naturall things, to wonderfull vses: and when he list, retire home into his owne Centre: and there, prepare more Meanes, to Ascend or Descend by: and, all, to the glory of God, and our honest delectation in earth.

Although, the Printer, hath looked for this Preface, a day or two, yet could I not bring my pen from the paper, before I had giuen you comfortable warning, and brief instructions, of some of the Commodities, by Statike, hable to be reaped: In the rest, I will therefore, be as briefe as it is possible: and with all, describing them, so far as accordingly. And that, you shall perceiue, by this, which in order cometh

## John Dee his Mathematicall Preface.

they can not prescribe a certaine number of Artes: and in eche, certaine vnpassable boundes, to God, Nature, and mans Industrie. New Artes, daily rise vp: and there was no such order taken, that, All Artes, should in one age, or in one land, or of one man, be made knowne to the world. Let vs embrace the gifts of God, and wayes to wisdom, in this time of grace, from above, continually bestowed on them, who thankfully will receive them: *Et bonis Omnia Cooperantur in bonum*.

Trochilike, is that Art Mathematicall, which demonstrateth the properties of all Circular motions, Simple and Compound. And by cause the frute herof, vulgarly receiued, is in Wheles, it hath the name of Trochilike: as a man would say, *Whole Art*. By this art, a Whele may be geuen which shall moue about, in any time assigned. Two Wheles may be giuen, whose turnynges about in one and the same tyme, (or equall tymes), shall haue, one to the other, any proportion appointed. By Wheles, may a straight line be described: Likewise, a Spirall line in plaine, Conicall Section lines, and other Irregular lines, at pleasure, may be drawn. These, and such like, are principall Conclusions of this Art: and helpe forward many pleasant and profitable Mechanicall workes: As Milles, to Saw great and very long Deale bordes, no man being by. Such haue I seene in Germany: and in the Citie of Prague: in the kingdome of Bohemia: Connyng Milles, Hand Milles for Corne grinding: And all manner of Milles, and Whele workes: By Winde, Smoke, Water, Waight, Spring, Man or Beast, moued. Take in your hand, *Agricola Vtre Italica*: and then shall you (in all Mines) perceiue, how great neede is, of Whele workes. By Wheles, straunge workes and incredible, are done: as will, in other Artes hereafter, appeare. A wonderful example of farther possibilitie, and present commoditie, was seene in my time, in a certaine Instrument: which by the Inuenter and Artificer (before) was sold for xx. Talentes of Golde: and then had (by misfortune) receaued some iniurie and hurt: And one *Iaculus of Cremona* did mend the same, and presented it vnto the Emperour Charles the fifth. *Hieronymus Cardanus*, can be my witnesse, that therein, was one Whele, which moued, and that, in such rate, that, in 7000. yeares only, his owne periode should be finished. A thing almost incredible: But how faine, I keepe me within my boundes: very many men (yet aliue) can tell.

Helicosophie, is nere Sister to Trochilike: and is, An Arte Mathematicall, which demonstrateth the designing of all Spirall lines in Plaine, on Cylinder, Cone, Sphere, Conoid, and Spharoid, and their properties appertaining. The vse herof, in Architecture, and diuerse Instruments and Engines, is most necessary. For, in many things, the Skreue worketh the feat, which, els, could not be performed. By helpe herof, it is recorded, that, where all the power of the Citie of Syracuse, was not hable to moue a certaine Ship (being on ground) mightie *Archimedes*, setting to, his Skruill Engine, cauled *Hiero* the king, by him self, at ease, to remoue her, as he would. Whereat, the King wondering: *And thence the king, in a voice, Argued by heretofore saying, From this day, forward (said the King) Credit ought to be giuen to Archimedes, what feuer he sayth.*

Pneumatistmie demonstrateth by close hollow Geometricall Figures, (regular and irregular) the straunge properties (in motion or stay) of the Water, Ayre, Smoke, and Fire, in their cōtinuittie, and

## John Dee his Mathematicall Preface.

meth next. For, whereas, it is so ample and wonderful, that an whole yeare long, one might finde fruitfull matter therein, to speake of: and also in practise, is a Threasure endles: yet will I glasse ouer it, with wordes very few.

This do I call Anthropographic. Which is an Art reformed, and of my preferment to your Service. I pray you, thinke of it, as of one of the chief pointes, of Humane knowledge. Although it be, but now, first Cōfirmed, with this new name: yet the matter, hath from the beginning, ben in consideration of all perfect Philosphers. Anthropographic, is the description of the Number, Measure, Waight, figure, Situation, and colour of euery diuerse thing, conteyned in the perfect body of MAN: with certain knowledge of the Symmetrie, figure, waight, Characterization, and due locall motion, of any parcell of the sayd body, assigned: and of Numbers, to the sayd parcell appertaining. This is the one part of the Definition, mete for this place: Sufficient to nouise, the particuaritie, and excellency of the Artes: and why it is, here, ascribed to the Mathematicals. Yf the description of the heavenly part of the world, had a peculiar Art, called *Astronomic*: If the description of the earthly Globe, hath his peculiar art, called *Geographic*. If the Matching of both, hath his peculiar Art, called *Cosmographic*: Which is the Description of the whole, and vniuersall frame of the world: Why should not the description of him, who is the Lesse world: and fro the beginning, called *Microcosmus* (that is, *The Lesse World*), And for whose sake, and seruise, all bodily creatures els, were created: Who also, participateth with Spirites, and Angels: and is made to the Image and similitude of God: haue his peculiar Art: and be called the *Art of Artes*: rather, then, either to wait a name, or to haue to base and improprie a name? You must of sundry professions, borrow or challenge home, peculiar partes herof: and farder proceede, as God, Nature, Reason and Experience shall informe you. The Anatomistes will refore to you, some part: The Physiognomistes, some: The Chyrurgians, some: The Metaposcopistes, some: The excellent, *Albert Durer*, a good parte: The Art of Perspective, will somwhat, for the Eye, helpe forward: *Pythagoras*, *Hipocrates*, *Plato*, *Galenus*, *Melietus*, & many other (in certaine tymes) will be Contributaries. And farder, the Heauen, the Earth, and all other Creatures, will eche shewe, and offer their Harmonious seruise, to fill vp, that, which wanteth herof: and with your own Experience, concluding: you may Methodically regiller the whole, for the posteritie: Whereby, good proue will be had, of our Harmonious, and Microcosmicall constitution. The outward Image, and vse herof, to the Art of *Zographic* and Painting, to Sculpture, and Architecture: (for Church, House, Fort, or Ship) is most necessary and profitable: for that, it is the chief base and foundation of them. Look in *Pitruuius*, whether, I deale sincerely for your behoufe, or no. Look in *Albertus Durerus*, *De Symmetria humani Corporis*. Look in the 7. and 8. Chapters, of the second booke, *De occulta Philosophia*. Consider the *Arte of Nee*. And by that, wade farder. Remember the *Delphical Oracle* *ΝΟΤΕΤΕ ΤΗΣ ΨΥΧΗΣ* (*Know thy selfe*) so long agoe pronounced: of so many a Philosopher repeated: and of the *Witch*, attempted: And then, you will perceiue, how long agoe, you haue bene called to the Schole, where this Arte might be learned. Well, I am nothing enuied, of the daye of some such, as thinke Sciences and Artes, to be but Seuen. *Heraps*, whose Such may, with ignorance, and shame enough, come short of them Seuen ali: and yet neuertheless

*MAN is the Lesse World.*

*\* Microcosmus. Lib. 3. Cap. 1.*

*To go to the bottom of the Sea without danger.*

## John Dee his Mathematicall Preface.

and as they are joyned to the Elementes next them. This Arte, to the Naturall Philosopher, is very profitable: to proue, that *Vacuum*, or *Emptines* is not in the world. And that, all Nature, abhorreth it so much: that, contrary to ordinary law, the Elementes will moue or stand. As, Water to ascend: rather then betwene him and Ayre, Space or place should be left; more then (naturally) that quantitie of Ayre requirerh, or can fill. Again, Water to hang, and not descend: rather then by descending, to leaue Emptines at his backe. The like, is of Fire and Ayre: they will descend: when, either, their Continuite should be dissolved: or their next Element forced from them. And as they will not be extended, to discontinuittie: So, will they not, nor yet of inuiscible force, can be prest or pent in space, not sufficient and auisferable to their bodily substance. Great force and violence will they vse, to enjoy their naturall right and libertie. Hereupon, two or three men together, by keeping Ayre vnder a great Cauldron, and forcing the same downe, orderly, may without harme descend to the Sea bottom: and continue there a tyme &c. Where, Note, how the thicker Element (as the Water) giueth place to the thynner (as, is the ayre): and receiue violence of the thinner, in manner, &c. Pumps and all manner of Bellows, haue their ground of this Art: and many other straunge deuises, as, *Hydraulica*, Organes going by water, &c. Of this Feat, (called commonly *Pneumatica*), goodly workes are extant, both in Greke, and Latin. With old and learned Schole men, it is called *Scientia de pleno & vacuo*.

Menadrie, is an Arte Mathematicall, which demonstrateth, how, about Natures vertue and power simple: Vertue and force may be multiplied: and so, to direct, to lift, to pull to, and to put or cast fro, any multiplied or simple, determined Vertue, Waight or Force: naturally, not, so, directible or moueable. Very much is this Art furthred by other Artes: as, in some pointes, by *Perspectiue* in some, by *Statike* in some, by *Trochilike* and in other, by *Helicosophie* and *Pneumatistmie*. By this Art, all Cranes, Gybbettes, & Ingines to lift vp, or to force any thing, any manner wayes, are ordred: and the certaine cause of their force, is knowne. As, the force which one man hath with the Duchewaghen Racker: therewith, to set vp agayne, a mighty waghen laden, being ouerthrowne. The force of the Crossbow Racker, is certainly, here, demonstrated. The reason, why one ma, doth with a leauer, lift that, which Sixe men, with their hands only, could not, so easily do. By this Art, in our common Cranes in London, where powre is to Crane vp, the waight of 1000. pound: by two Wheles more (by good order aded) *Arte* concluded, that there may be Craned vp 200000. pound waight &c. So well knowe *Archimedes* this Arte: that he alone, with his deuises and engines, (twice or thrice) spoyled and discomfited the whole Army and Hoste of the Romaines, besieging *Syracusa*, *Marcus Marcellus* the Consul, being their Generall Capitaine. Such huge Stones, so many with such force, and so farr, did he with his engines haile among them, out of the Citie. And by Sea likewise: though their Ships might come to the walls of *Syracusa*, yet he vterly confounded the Romaine Nauye. What with his mighty Stones hurling: what with Pikes of 18 fote long, made like flutes: which he forced almost a quarter of a myle: What, with his catching hold of their Shypps, and hofing them vp about the water, and suddenly letting them fall into the Sea againe: what with his Burning Glaffes: by which he fired their other Shippes a fad of what, with his other pollicies, deuises, and engines, he so manfully accout him selfe: that all the Force, courage, and pollicie of the Romaines (for a great season) could

*Pitruuius in Mar. Marcellus. Ingines Syph. in. Polio. Fluit. Syntagma. T. 1. Lib. 1. de Inuenc.*

*\* Galien. Anatom.*



## John Dee his Mathematicall Praeface.

could nothing preuaile, for the winning of Syracusa. Whereupon, the Romans named *Archimedes*, *Brasiers*, and *Centinians*. *Zonarus* maketh mention of one *Proclus*, who so well had perceived *Archimedes* Arte of *Menadrie*, and had so well instructed of his owne, that with his Burning Glaffes, being placed vpon the wallles of Bylance, he multiplied for the heate of the Sunne, and directed the beames of the flame against his enemies Nauiue with such force, and so suddenly (like lightning) that he burned, and destroyed both man and ship. And *Dion* specifeth of *Prifcus*, a *Geometrist* in *Bylance*, who inuented and vsed sondry Engines, of Force multiplied: Which was cause, that the *Emperour Scuerus* pardoned him, his life, after he had wonne *Bylance*: Bycause he honored the Arte, wytt, and rare indutrie of *Prifcus*. But nothing inferior to the inuention of these engines of Force, was the inuention of *Guines*. Which, from an English man, had the occasion and order of first inuention: though in any other land, and by other men, it was first executed. And they that should see the record, where the occasion and order generally, of *Gunning* is first discoursed of, would thinke: that small things, might and edon: coming to wise mens confideration, and indutrious mens handling, may grow to be of force incredible.

*Hypogeiodie*, is an Arte Mathematicall, demonstratynge, how, vnder the Spherickall Superficies of the earth, at any depth, so any perpendicular line assigned (whose distance from the perpendicular of the entrance: and the Azimuth, likewise, in respect of the said entrance, is knowne) certaine way may be prescribed and gone: And how, any way about the Superficies of the earth designed, may vnder earth, at any depth limited, be kept: goynge alwayes, perpendicularly, vnder the way, on earth designed: And, contrarywise, Any way, (straight or crooked), vnder the earth, beyng giuen: vpon the vifce, or Superficies of the earth, to Lyne out the same: So, as, from the Centre of the earth, perpendiculars drawen to the Spherickall Superficies of the earth, shall precisely fall in the Correspondent pointes of those two wayes. This, with all other Cases and circumstances herein, and appertinances, this Arte demonstrateth. This Arte, is very ample in variety of Conclusions: and very profitable sundry wayes to the Common Wealth. The occasion of my Inuention this Arte, was at the request of two Gentlemen, who had a certaine vnto of gaine vnder ground: and their groundes did ioyne ouer the worke: and by reason of the crookednes, diuers depths, and heighthes of the way vnder ground, they were in doubt, and at controuerie, vnder whole ground, as then, the worke was. The name onely (before this) was of me published, *De Itinere Subterraneo*: The rest, be at Gods will. For Pioners, Miners, Diggers for Mettalls, Stone, Cole, and for secret passages vnder ground, betwene place and place (as this land hath diuerse) and for other purposes, any man may easily perceiue, both the great fruite of this Arte, and also in this Arte, the great aide of Geometrie.

*Hydragogie*, demonstrateth the possible leading of Water, by Natures lawe, and by artificiall helpe, from any head (being a Spring, standing, or running Water) to any other place assigned.

## John Dee his Mathematicall Praeface.

by Sunne or Sterres direction (in certaine time) require ouersight and reformation, according to the heauenly *Aequinoctiall* Motion: besides the inaxialitie of their owne Operation. There remaineth (without parabolical meaning herein) among the Philosophers, a more excellent, more commodious, and more marvellous way, then all these: of hauing the motion of the Primouant (or first *Aequinoctiall* motion), by Nature and Arte, limited: which you shall (by further search in waighier studies) hereafter, vnderstand more of. And so, it is tyme to finish this Annotation, of Tymes distinction, vied in our common, and priuate affaires: The commoditie whereof, no man would want, that can tell, how to bestow his tyme.

*Zographie*, is an Arte Mathematicall, which teacheth and demonstrateth, how, the Interfection of all vifuall Pyramides, made by any playne assigned, (the Centre, distance, and lightes, beyng determined) may be, by lynes, and due propre colours, represented. A notable Arte, is this and would require a whole Volume, to declare the property thereof: and the Commodities ensuing. Great Skill of *Geometrie*, *Arithmetike*, *Perspectiue*, and *Anthropographie*, with many other particular Artes, hath the *Zographer*, neede of, for his perfection. For, the most excellent Painter, (who is both the propre Mechanic, & Imitator sensible, of the *Zographer*) hath attained to such perfection, that Sense of Man and beast, haue iudged things painted, to be things naturall, and not artificiall: alieue, and not dead. This Mechanicall *Zographer* (commonly called the Painter) is meruallous in his Skill: and feemeth to haue a certaine diuine power: As, of frendes absent, to make a frendly, present comfort: yea, and of frendes dead, to giue a continuall, silent presence: not onely with vs, but with our posteritie, for many Ages. And so procedynge, Consider, How, in Winter, he can shew you, the liuely view of Sommers Ioy, and riches: and in Sommer, exhibite the countenance of Winters dolefull State, and nakednes. Cities, Townes, Fortes, Woodes, Armys, yea whole Kingdomes (be they neuer so farre, or greater) can he, with ease, bring with him, home (to any mans iudgement) as Paternes liuely, of the things rehearsed. In one little house, can he, enclose (with great pleasure of the beholders), the portraiture liuely, of all vifible Creatures, either on earth, or in the earth, liuing: or in the waters lying, Creeping, flyding, or swimming: or of any foule, or fly, in the ayre flying. Nay, in respect of the Sterres, the Skie, the Cloudes: yea, in the shew of the very light it selfe (that Diuine Creature) can he match our eyes Iudgement, most nerely. What a thing is this: things not yet being, he can represent so, as, at their being, the Picture shall frame (in manner) to haue Created them. To what Artificer, is not Picture, a great pleasure and Commoditie: Which of them all, will refuse the Direction and ayde of Picture: The Architect, the Goldsmith, and the Arras Weauer, of Picture, make great account. Our liuely Herbs, our portraitures of birds, beastes, and fishes: and our curious Anatomies, which way, are they most perfectly made, or with most pleasure, of vs beholder? Is it not, by Picture onely? And if Picture, by the Industry of the Painter, be thus commodious and meruallous: what shall be thought of *Zographie*, the Scholemaster of Picture, and chief gouernor? Though I mention not *Sculpture*, in my Table of Artes Mathematicall: yet may all men perceiue, How, that Picture and *Sculpture*, are Sisters germane: and both, right profitable, in a Common wealth, and of *Sculpture*, as well as of Picture, excellent Artificers haue written great booke in commendation. Witnesse I take, of *Georgio Vasari*, *Pittore Arcetino*: of *Pomponius Gauricus*: and other. To these two Artes, (with other, is a certaine od Arte, called *Alchymia*, that much beholding: more, then the common *Sculptor*, *Entayler*, *Keruer*, *Cutter*, *Graver*, *Funder*,

## John Dee his Mathematicall Praeface.

Long, hath this Arte bene in vfe: and much thereof written: and very marvellous workes therein, performed: as may yett appeare, in Italy: by the Ruynes remaining of the Aqueeducts. In other places, of Miners leading through the Mainie land, Nauigable many a Mile. And in other places, of the marvellous forcings of Water to Ascend, which all declare the great Skill, so be required of him, who should in this Arte be perfecte, for all occasions of waters possible leading. To speake of the allowance of the Fall, for every hundred foote: or of the Venells (if the waters labour be faire, and great) I neede not: Seing, at hand (about vs) many expert men can sufficiently testifie, in effeate, the order: though the Demonstration of the Necessitie thereof, they know not: Nor yet, if they should be led, vp and downe, and about Mountaines, from the head of the Spring: and then, a place being assigned: and of them, to be demanded, how low or high, that last place is, in respect of the head, from which (so crookedly, and vp and downe) they be come: Perhaps, they would not, or could not, very readily, or nerely asfoyle that question. *Geometrie* therefore, is necessary to *Hydragogie*. Of the sundry wayes to force water to ascend, either by *Tympane*, *Kettell mills*, *Skrue*, *Cieslike*, or such like: in *Pitruini*, *Agriola*, (and other, fully the manner may appeare. And so, thereby, alio be most euidet, how the Artes, of *Pneumatisme*, *Heliosophie*, *Statike*, *Trachike*, and *Menadrie*, come to the furniture of this, in Speculation, and to the Commoditie of the Common Wealth, in practise.

*Horometrie*, is an Arte Mathematicall, which demonstrateth, how, at all times appointed, the precise vifuall denominatio of time, may be knowne, for any place assigned. These wordes, are smooth and plaine easie English, but the reach of their meaning, is farther, then you would lightly imagine. Some part of this Arte, was called in olde time, *Cronometrie*, and of late, *Horologigraphia*: and in English, may be termed, *Dialling*. Ancient is the vfe, and more ancient, is the Inuention. The vfe, doth well appeare to haue bene (at the least) about two thousand and three hundred yeare agoe: in King *Achaz*, Diall, then, by the Sunne, shewing the distinction of time. By Sunne, Mone, and Sterres, this Dialling may be performed, and the precise Time of day or night known. But the demonstratiue delineation of these Dials, of all fortres, requirith good Skill, both of *Astronomie*, and *Geometrie* Elementall, Spherickall, Phenomenall, and Conickall. Then, to the groundes of the Arte, for any regular Superficies, in any place offered: and (in any possible apt position thereof) thereon, to describe (all manner of wayes) how, vifuall howers, may be (by the same shadow) truly determined: will be found no flight Painters worke. So to Paint, and prescribe the Sunnes Motion, to the breadth of a haire. In this Feare (in my youth) I Inuented away, How in any Horizontal, Murall, or *Aequinoctiall* Diall, &c. At all howers (the Sunne shinning) the Signe and Degree ascendent, may be knowne. Which is a thing very necessary for the Rising of those fixed Sterres: whose Operation in the Ayre, is of great might, euidently. I speake no further, of the vfe hereof. But forasmuch as, Mans affaires require knowledge of Tymes & Moiments, when, neither Sunne, Mone, or Sterre, can be seene: Therefore, by Indutrie Mechanicall, was inuented, first, how, by Water, running orderly, the Time and howers might be known: whereof, the famous *Ciesbius*, was Inuenter: a man, of *Pitruini*, to the Skie (justly) extolled. Then, after that, by Sand running, were howers measured: Then, by *Trachike* with weight: And of late time, by *Trachike* with Spring: without weight. All these, d.i.j.

## John Dee his Mathematicall Praeface.

der, or *Paynter* (or) know their Arte, to be commodious.

*Architecture*, to many may seeme not worthy, or not mete, to be reckned among the Artes Mathematicall. To whom, I thinke good, to giue some account of my so doynge. Not worthy, (will they say), bycause it is but for building, of a house, Pallace, Church, Forte, or such like, grosse worke. And you, also, defined the Artes Mathematicall, to be such, as dealt with no Mattriell or corruptible thing: and also did demonstratiue procede in their faculty, by Number or Magnitude. First, you see, that I count, here, *Architecture*, among those Artes Mathematicall, which are Deriued from the Principals: and you know, that such, may deale with Naturall things, and sensible matter. Of which, some draw nerer to the Simple and absolute Mathematicall Speculation, then other do. And though, the *Architect* procureth, enformeth, & directeth, the Mechanic, to handworke, & the building actual, of house, Castell, or Pallace, and is chief Iudge of the same: yet, with him selfe (as chief *Master* and *Architect*, ) remaineth the Demonstratiue reason and cause, of the Mechanicis worke: in lyne, plaine, and Solid: by *Geometrical*, *Arithmetical*, *Opticall*, *Musickall*, *Astronomical*, *Cosmographical* (& to be brief) by all the former Deriued Artes Mathematicall, and other Naturall Artes, habile to be confirmed and established. If this be so, then, may you thinke, that *Architecture*, hath good and due allowance, in this honest Company of Artes Mathematicall Deriuate. I will, hercin, craue Iudgement of two most perfect *Architectes*: the one, being *Pitruinus*, the Romaine: who did write ten bookes thereof, to the Emperour *Augustus* (in whose daies our Heauenly Archemaster, was borne): and the other, *Leo Baptista Albertus*, a Florentine: who also published ten bookes thereof. *Architecture* (sayth *Pitruinus*) est *Scientia* plurimorum disciplinarum & variis eruditionibus ornata: cuius Iudicio probantur omnia, quae ab ceteris Artificibus perficiuntur opera. That is, *Architecture*, is a Science garnished with many doctrines & diuerse instructions: by whose Iudgement, all workes, by other workmen finished, are Iudged. It followeth, *Ea nascitur ex Fabrica, & Ratiocinatione*. *Ratiocinatio autem est, quae res fabricatas, selectis ac ratione proportionis, demonstrare atq; explicare potest*. *Architecture*, groweth of Framing, and Reasoning, &c. Reasoning is that, which of things framed, with forecast, and proportion: can make demonstration, and manifest declaration. Againe, *Cum, in omnibus enim rebus, tum maximè etiam in Architectura, hac duo insunt: quod significatur, & quod significat. Significatur proposita res, de qua dicitur: hanc autem Significat Demonstratio, rationibus doctrinarum explicata*. Forasmuch as, in all things: therefore chiefly in *Architecture*, these two things are: the thing signified: and that which signifieth. The thing propounded, whereof we speake, is the thing signified. But Demonstration, expressed with the reasons of diuerse doctrines, doth signifie the same thing. After that, *Vt literatus sit, peritus Graphidos, eruditus Geometria, & Optics non ignarus: instructus Arithmetica: historiarum complures nouerit, Philosophos diligenter audierit: Musicum finierit: Medicina non sit ignarus, responsa turpiter nouerit: Astrologiam, Celsi, rationes cognitas habet. An Architect* (sayth he) ought to vnderstand Languages, to be skilfull of Painting, well instructed in Geometrie, not ignorant of Perspectiue, furnished with Arithmetike, haue knowledge of many histories, and diligently haue heard Philosophers, haue skill of Musike, not ignorant of Physike, know the answers of Lawyers, and haue Astro-



## John Dee his Mathematicall Preface.

nomie, and the courses Celestiall, in good knowledge. He geueth reason, orderly, whereof all these Artes, Doctrines, and Instructions, are requisite in an excellent Architect. And (for breuitie) omitting the Latin text, thus he hath. Secondly, it is behoofull for an Architect to haue the knowledge of Painting: that he may the more easilie fashion out, in patternes painted, the forme of what worke he liketh. And Geometrie, geueth to Architecture many helpes: and first teacheth the Use of the Rule, and the Compasse: wherby (chiefly and easilie) the descriptions of Buildings, are dispatched in Groundplots: and the directions of Squires, Leuels, and Lines. Likewise, by Perspective, the Lights of the beauen, are well led, in the buildinges: from certaine quarters of the world. By Arithmetike, the charges of Buildings are summed together: the measures are expressed, and the hard questions of Symmetries, are by Geometricall Meanes and Methods discoursed on. &c. Besides this, of the Nature of things (which in Greeke is called *gomonasia*) Philosophie doth make declaration. Which, it is necessary, for an Architect, with diligence to haue learned: because it bath many and diuers naturall questions: as specially, in Aqueductes. For in their courses, leadinges about, in the leuell ground, and in the mountinges, the naturall Spiritus or breathes are ingendered diuers wayes: The hindrances, which they cause, no man can helpe, but he, which out of Philosophie, hath learned the originall causes of things. Likewise, who soener shall read Ctesibius, or Archimedes bookes, (and of others, who haue written such Rules) can not thinke, as they do: vnlesse he shall haue receaued of Philosophers, instructions in these things. And Musike he must needs know: that he may haue vnderstanding, both of Regular and Mathematicall Musike: that he may temper well his Balistes, Catapultes, and Scorpions, &c. Moreover, the Brasen Vessels, which in Theatres are placed by Mathematicall order in ambries vnder the Steppes: and the diuersities of the soundes (which the Grecians call *choia*) are ordered according to Muscull Symphonies & Harmonies: being distributed in 3 Circutes, by Diatessaron, Diapente, and Diapason. That the conuenient voyce, of the players sound, w<sup>h</sup>et came to these preparations, made in order: there being increased: with 3 increasing, might come more cleare & pleasant, to 3 eares of the lookers on. &c. And of Astronomie is knowe 3 East, West, South, and North. The fashion of the beauen, the Equinox, the Solstice, and the course of the sterres: Which things, vnlesse one knowe: he can not perceiue, any thing at all, the reason of Horologies. Seing therefore this ample Science, is garnished, beautified and stored, with so many and sundry skills and knowledges: I thinke, that none can iustly account them selues Architects, of the Iudgement. But they onely, who from their childer yeares, ascending by these degrees of knowledges, being fostered vp with the attening of many Languages and Artes, haue wonne to the high Tabernacle of Architecture, &c. And to whom Nature hath giuen such quicke Circumspection, sharpnes of wit, and Memorie, that they may be very absolutely skillfull in Geometrie, Astronomie, Musike, and the rest of the Artes Mathematicall;

## John Dee his Mathematicall Preface.

Hed, the Prouost, the Director, and Iudge of all Artificiall workes, and all Artificers. For, the true Architect, is habile to teach, Demonstrate, distribute, describe, and Iudge all workes wrought. And he, onely, searcheth out the causes and reasons of all Artificiall things. Thus excellent, is Architecture: though few (in our dayes) attayne thereto: yet may not the Arte, be otherwise thought on, then in very dede it is worthy. Nor we may not, of ancient Artes, make new and imperfect Definitions in our dayes: for feare of Artificers: No more, than we may synche in the Definitions of *Wisdom*, or *Manlytie*, or of *Friendship* or of *Iustice*. No more will I consent, to Diminish any whit of the perfection and dignitie, (by iust cause) allowed to absolute Architecture. Vnder the Direction of this Arte, are three principall, necessary Mechanicall Artes. Namely, *Howling*, *Fortification*, and *Navigation*. *Howling*, I vnderstand, both for Diuine Seruice, and Mans common v sage: publike, and priuate. Of *Fortification* and *Navigation*, strange matter might be told you: But perchance, some will be tyred, with this Bederoll, all ready rehearsed: and other some, will nicely nip my gorge and homely discoursing with you: made in post haste: for feare you should wane this true and friendly warning, and tall guying, of the Power Mathematicall. Lyfe is short, and vncertaine: Tymes are perillous: &c. And still the Printer awayting, for my pen staying: All these things, with farder matter of Ingratfullnes, giue me occasion to pull away, to the other Artes remaining, with all speed possible.

The Arte of Navigation, demonstrateth how, by the shortest good way, by the aptest Directio, and in the shortest time, a sufficient Ship, betwene any two places (in passage Nauigable), assigned: may be conducted: and in all formes, & naturall disturbances chauncyng, how, to vse the best possible meanes, whereby to recouer the place first assigned. What need, the Master Pilote, hath of other Artes, here before recited, it is ealie to knowe, as of *Hydrographie*, *Astronomie*, *Astrologie*, and *Harmonie*. Presuppoting continually, the common Base, and foundation of all: namely *Arithmetike*, and *Geometrie*. So that, he be habile to vnderstand, and Iudge his owne necessary Instrumentes, and furniture Necessary: Whether they be perfectly made or no: and also can, (if need be) make them, hym selfe. As Quadrantes, The Altronomers Ryng, The Altronomers Staffe, The Astrolabe vniuersall. An Hydrographical Globe, Charts Hydrographical, true, (not with parallel Meridians). The Common Sea Compass: The Compass of variation: The Proportional, and Pseudoall Compasles (of me fauoured, for our two Moscouy Master Pilotes, at the request of the Company) Clockes with spring: houre, halfe houre, and three houre Sandglasses: & sundry other Instrumentes: And also, be habile, on Globe, or Playne to describe the Pseudoall Compasse: and duely to vse the same, to all manner of purposes, whereto it was inuented. And also, be habile to Calculate the Planetes places for all tymes.

Moreover, with Sonne Mone or Sterre (or without) be habile to define the Longitude & Latitude of the place, which he is in: So that, the Longitude & Latitude of the place, from which he layed, be giuen: or by him, be knowne, whereto, appertayneth expert meanes, to be certified out, of the Ships way. &c. And by forcing the Rising, Setting, Nonetiding, or Midnighing of certaine tempestuous fixed Sterres: or their Coniunctions, and Anglynges with the Planetes, &c. he ought to haue expert coniecture of Stormes, Tempestes, and Spoutes: and such lyke Meteorological effects, dangerous on Sea. For (as Plato sayth), *Mutationes*,

appert-

## John Dee his Mathematicall Preface.

call: Such furmount and passe the calling, and state, of Architects: and are become Mathematicians, &c. And they are found, yeldome. As, in tymes past, was Aristarchus Samius: Philolaus, and Archytas, Tarentynes: Apollonius Pergaeus: Eratosthenes Cyrenens: Archimedes and Scapae Syracusians. Who also, left to their posteritie, many Engines and Gnomoniuall workes: by numbers and naturall meanes, inuented and declared.

Thus much, and the same wordes (in sense) in one onely Chapter of this Incomparable *Architect Vitruuius*, shall you finde. And if you should, but rike his booke in your hand, and slightly looke thorough it, you would say straight way: This is *Geometrie*, *Arithmetike*, *Astronomie*, *Musike*, *Anthropographie*, *Hydrographie*, *Harmonie*, &c. and (to conclude) the Storehouse of all workemanship. Now, let vs listen to our other Iudge, our Florentine, *Leo Baptista*: and narrowly consider, how he doth determine of Architecture. *Sed antequam progrediar*, &c. But before I procede any further (sayth he) I thinke, that I ought to expresse, what man I would haue to be allowed an Architect. For, I will not bring in place a Carpenter: as though you might compare him to the Chief Masters of other Artes. For the hand of the Carpenter is the Architects Instrument. But I will appoint the Architect to be that man, who hath the skill, (by a certaine and meruitous meanes and way,) both in minde and Imagination to determine: and also in worke to finish: what workes so euer, by motion of waighe, and cupping and framyng, together of bodies, may most aptly be Commodious for the worthwhile Vses of Man. And that he may be able to performe these things, he hath need of attynnyng and knowledge of the best, and most worthy thynges, &c. The whole Feate of Architecture in building, consisteth in Lineament, and in Framyng. And the whole power and skill of Lineament, tendeth to this: that the right and absolute way may be had, of Copying and ioyning Lines and angles: by which, the face of the building or frame, may be comprehended and concluded. And it is the property of Lineament, to prescribe vnto buildynges, and euery part of them, in an apt place, & certaine nuber: a worthy manner, and a seemely order: that, so, the whole forme and figure of the building, may rest in the very Lineament, &c. And we may prescribe in mynde and imagination the whole formes, all materiall stuffe being selected. Which point we shall attayne, by Notyng and forepointing the angles and lines, by a sure and certaine direction and connexion. Seing then, these things, are thus: Lineament, shalbe the certaine and constant prescribing, conceived in mynde: made in lines and angles: and finished with a learned minde and wyte. We thanke you Master Baptista, that you haue so aptly brought your Arte, and phrase therof, to haue some Mathematicall perfection: by certaine order, nuber, forme, figure, and Symmetrie mental: all naturall & sensible stuffe set a part. Now, then, it is euident, (Gentle reader) how aptely and worthily, I haue prefixed Architecture, to be bred and fostered vpp in the Dominion of the perles Princeps, Mathematica: and to be a naturall Subject of others. And the name of Architecture, is of the principallme, which this Science hath, above all other Artes. And Plato affirmeth, the Architect to be a Master over all, that make any worke. Whereupon, he is neither Smith, nor Builder: nor, separately, any Artificer: but the

A Mathematician.

Vitruuius,

Who is an Architect.

\* The Inuentor of perfect Architecture.

What, Lineament is.

And, &c.

And, &c.

And, &c.

And, &c.

And, &c.

And, &c.

And, &c.

And, &c.

And, &c.

And, &c.

And, &c.

And, &c.

And, &c.

And, &c.

And, &c.

And, &c.

And, &c.

And, &c.

And, &c.

And, &c.

And, &c.

And, &c.

And, &c.

And, &c.

And, &c.

And, &c.

And, &c.

And, &c.

And, &c.

And, &c.

And, &c.

And, &c.

And, &c.

And, &c.

And, &c.

And, &c.

And, &c.

And, &c.

And, &c.

And, &c.

And, &c.

And, &c.

And, &c.

And, &c.

And, &c.

And, &c.

## John Dee his Mathematicall Preface.

opportunitate, temporum presentire, non minus rei militari, quam Agricultura, Nauigationi, conuenit. To foresee the alterations and opportunities of tymes is conuenient, no lesse to the Art of Warre, then to Husbandry and Nauigation. And besides such cunning meanes, more euident tokens in Sonne and Mone, ought of hym to be knowne: such as (the Philosophicall Poete) Virgilius teacheth, in hys Georgicks. Where he sayth,

Sol quod & coxeris & quom se condit in vndas,  
Signa dabit, Solem certissima signa sequantur &c.

Nam sape videmus,

Ipsius in cultu variis errare coloribus.

Ceruleus, pluviam denunciat igneus Euros.

Sin macula succipient rutilo immixtus igni,

Omnia tum pariter vento, nubibus, videtis

Ferere: non illa quisquam me nolle per altum

Ire, nec, a terra moucat conuelleret funem. &c.

Sol tibi signa dabit. Solem quis decere saluum

Audeat? &c.

And so of Mone, Sterres, Water, Ayre, Fire, Wood, Stones, Birdes, and Beastes, and of many thynges (as a certaine Sympathicall forewarning may be had: sometimes to great pleasure and profit, both on Sea and Land. Sufficiently, for my present purpose, it doth appeare, by the premises, how Mathematicall, the Arte of Navigation, is: and how it needeth and also vseth other Mathematicall Artes: And now, if I would go about to speake of the manifold Commodities, conmyng to this Land, and others, by Shypps and Navigation, you might thinke, that I catch at occasions, to vse many wordes, where no need is.

Yet, this one thyng may I, iustly say. In Navigation, none ought to haue greater care, to be skillfull, then our English Pilotes. And perchance, some, would more attempt: And other some, more willingly would be ayding, if they wist certainly, what Priuiledge, God had endued this Land with, by reason of Situation, most commodious for Navigation, to Places most Famous & Riche. And though, (of late) a young Gentleman, a Couragious Capitaine, was in a great readiness, with good hope, and great causes of persuation, to haue ventured, for a Discouery, (either Westerly, by Cape de Paramasia: or Easterly, about Nova Zemla, and the Cyrcusifer) and was at the very nere tyne of Attempting, called and employed otherwhile (both then, and since,) in great good furrice to his Countrey, as the Irish Rebels haue" tasked: Yet, I say, (though the same Gentleman, doo not hereafter, deale therewith) Some one, or other, should listen to the Matter: and by good aduise, and discrete Circumspection, by little, and little, wyne to the sufficient knowledge of that Trade and Voyage: Which, now, I would be fory, (through Carelesnesse, want of Skill, and Courage,) should remayne vknownne and vheard of. Seing, also, we are herein, halfe Challenged, by the learned, by halfe request, published. Therof, verely, might grow Commoditie, to this Land chiefly, and to the rest of the Christen Common wealth, farre passing all riches and worldly Treasure.

Thaumaturgike, is that Art Mathematicall, which giueth certaine order to make strange workes, of the sense to be perceived, and of men greatly to be wondred at. By sundry meanes, this Wonder-workes is wrought. Some, by Pneumatike. As the workes of Ctesibius and Hero,

A.3.

Some



## John Dee his Mathematicall Preface.

Some by waight, wherof *Timaeus* speaketh. Some, by Stringes strayed, or Springs, therewith limiting liuely Motions. Some, by other means, as the Images of Met-cures; and the braile hed, made by *Alberus Magnus*, which dyd seme to speake. *Berilius* was excellent in these feates. To whom, *Cassiodorus* writing, sayth, *Tour purpose is to know profound thynges; and to shew meruayles. By the disposition of your Arte, Metals do low: Diomedes of brasse, doth blow a Trumpet loude: a brasse Serpent biffeth byrdes made, sing sweetly. Small thynges we rehearse of you, who can Imitate the heauen.* &c. Of the straunge Selfmouyng, which, at Saint Denys, by Paris, \* I saw, ones or twice (*Orontius* beyng then with me, in Company) it were to straunge to tell. But some haue written it. And yet, (I hope) it is there, of other to be seene. And by *Perpetuall* also straunge thynges, are done. As partly (before) I gaue you to vnderstand in *Perpetuall*. As, to see in the Ayre, a liof, the liuely Image of an other man, either walkyng to and fro: or standyng still. Likewise, to come into an house, and there to see the liuely shew of Gold, Silver or precious stones; and commyng to take them in your hand, to finde nought but Ayre. Herby, haue some men (in all other matters counted wile) fouly ouerhot the felues: misdealing of the meanes. Therefore sayd *Claudius Celestinus*. *Hodie magna literatura vniuersi & magna reputationis videmus, opera quedam quasi miranda, supra Naturā putare: de quibus in Perpetuall deus causam facilius reddidisset.* That is, Now a dayes, we see some men, yea of great learning and reputation, to Iudge certain workes as meruaylous, above the power of Nature: Of which workes, one that were skillfull in *Perpetuall* might easily haue giuen the Cause. Of *Archimedes* Sphære, *Cicero* witnesseth. Which is very straunge to thinke on. For when *Archimedes* (sayth he) did fasten in a Sphære, the mouynges of the Sonne, Mone, and of the five other Planets, he did, as the God, which (in *Timæus* of *Plato*) did make the world. That one turnyng, should rule motions most unlike in slownes, and swiftnes. But a greater cause of meruayling we haue by *Claudius* report herof. Who affirmeth this *Archimedes* work, to haue ben of Glasse. And discouereth of it more at large: which I omit. The Doue of wood, which the Mathematician *Archytas* did make to flye, by *Aeglius* spoken of. Of *Dædalus* strange Images, *Plato* reporteth. *Homere of Vulcanus Selfmouers*, (by secret wheles) leaueh in writing. *Aristotle* in his *Politicks*, of both, maketh mention. Meruaylous was the workmanship of late dayes, performed by good skill of *Trachilus*, &c. For in Noremberge, A flye of lern, beyng let out of the Artificers hand, did (as it were) fly about by the geses, at the table, and at length, as though it were weary, retourned to his masters hand agayne. Morouer, an Artificiall Eagle, was ordered, to fly out of the same Towne, a mighty way, and that a loft in the Ayre, toward the Emperour comming thither: and followed hym, beyng come to the gate of the towne. Thus, you see, what, Arte Mathematicall can performe, when Skill, will, Industry, and Ability, are duely applied to profect.

And for these, and such like marueilous Actes and Feates, Naturally, Mathematically, and Mechanically, wrought and continued: ought any honest Student, and Modest Christian Philosopher, be counted, & called a Coniurer? Shall the folly of Idiotes, and the Mallice of the Scornfull, so much preuaile, that He, who seeketh no worldly gaue or glory at their handes: But onely, of God, the thesaur of heavenly wisdom, & knowledge of pure veritie: Shall he (I say) in the meane space,

## John Dee his Mathematicall Preface.

space, be robbed and spoiled of his honest name and fame? He that feareth (by S. Pauls aduertisement) in the Creatures Properties, and wonderfull vertues, to finde iuste cause, to glorifie the Eternall, and Almighty Creator by: Shall that man, be (in hugger mugger) condemned, as a Companion of the Helhoued, and a Caller, and Coniurer of wicked and damned Spirtes: He that bewaileth his great want of time, sufficient (to his contentation) for learning of Godly wisdom, and Godly Verities in: and onely therein fetterh all his delight: Will that ma leefe and abuse his time, in dealing with the Chiefe enemy of Christ our Redemer: the deadly foe of all mankind: the subtle and impudent peruerter of Godly Verities: the Hypocriticall Crocodile: the Enuious Basilisk, continually defrous, in the rinde of an eye, to destroy all Mankind, both in Body and Soule, eternally? Surely (for my part, somewhat to say hercin) I haue not leamed to make so brutish, and so wicked a Bargaine. Should I, for my xx. or xxv. yeares Studie: for two or three thousand Markes spending: seven or eight thousand Miles going and trauielling, solely for good learnings sake: And that, in all manner of vertues: in all manner of waies and passages: both early and late: in danger of violence by man: in danger of defraction by wilde beastes: in hunger: in thirst: in perillous heates by day, with toyle on foot: in dangerous dampes of colde by night, almost be-reuing life: (as God knoweth) with lodgings, oft times, to small end: and vniuoluntarily to little securitie. And for much more (then all this) done & sufficed, for Learning and attaining of Wisdom: Should I (I pray you) for all this, no other wile, nor more wantonly: or (by Gods mercifullnes) no more luckily, haue fished, with so large, and costly a Net, so long time in drawing (and that with the helpe and aduise of Lady Philosophie, & Queene Theologie): but at length, to haue catched, and drawn vp, \* a Frog? Nay, a Deuill? For so, doth the Common people Prater Imagine and Langle: And so, doth the Malicious Korne, secretly wille, & brauely and boldly face down, behinde my backe. Ah, what a miserable thing is this kinde of Men: How greates the blindnes & boldnes, of the Multitude, in thynges about their Capacitie? What a Land: what a People: what Manners: what Times are these? Are they become Deuils, them felues; and, by false witnesse bearing against their Neighbour, would they also, become Murderers? Doth God, so long geue them respite, to reclaim them felues in, from this horrible floundering of the gillie: contrary to their owne Consciences: and yet will they not cease? Doth the Innocent, forbear the calling of them, Iudicially to auerifie him, according to the rigour of the Lawes: and will they despise his Charitable patience? As they, against him, by name, do forge, fable, rage, and raise flander, by Word & Print: Will they prouoke him, by worde and Print, likewise, to Note their Names to the World: with their particular deuises, fables, bestly Imaginations, and vnchristen-like flanders? Well: Well. O (you such) my vnkinde Country men. O vnthankfull Country men. O vnthankfull Country men. O Brainlesse, Rascall, Spitefull, and Disdainfull Country men. Why oppresse you me, thus violently, with your flandering of me? Contrary to Veritie: and contrary to your owne Consciences? And I, to this hower, neither by worde, deede, or thought, haue bene, my way, hurtfull, damageable, or iniurious to you, or yours? Haue I so long, so dearily, so fure, so carefully, so painfully, so dangerously fought & trauielled for the learning of Wisdom, & attynnyng of Verue: And in the end (in your iudgement) am I become, worse, then when I began? Worfe, the a Mad man? A dangerous Member in the Common Wealth: and no Member of the Church of Christ? Call you this, to be Learned? Call you this, to be a Philosopher? and a louer of Wisdom? To forsake the straight heavenly way: and to wallow in the broad way of

\* A prouerb, Fyres fift, and caught a Frog.

A.ij. duos.

## John Dee his Mathematicall Preface.

damnation? To forsake the light of heavenly Wisdom: and to lurke in the dungeon of the Prince of darkenes? To forsake the Veritie of God, & his Creatures: and to fawne vpon the Impudent, Craftie, Obliterate Lier, and continuall disgracer of Gods Veritie, to the vttermost of his power? To forsake the Life & Blisse Eternall: and to cleaue vnto the Author of Death euertlasting? That Murderous Tyrant, most greedily awaiting the Pray of Mans Soule? Well: I thanke God and our Lorde Iesus Christ, for the Comfort which I haue by the Examples of other men, before my time: To whom, neither in godlines of life, nor in perfection of learning, I am worthy to be compared: and yet, they sustained the very like Injuries, that do: or rather, greater. Patient *Socrates*, his *Apologie* will testifie: *Apolonius* his *Apologie*, will declare the Brutishnesse of the Multitude. *Isaannes Victor*, Earle of Mirandula, his *Apologie* will teach you, of the Raging flander of the Malicious Ignorant against him. *Isaannes Trithemius*, his *Apologie* will specifie, how he had occasion to make publicke Protestation: as well by reason of the Rude Simple: as also, in respect of such, as were counted to be of the wisest sort of men. Many could I recite: But I deferre the precise and determined handling of this matter: being loth to detect the Folly & Mallice of my Native Country men. \* Who, so hardly, can digest or like any extraordinary course of Philosophicall Studies: not falling within the Compasse of their Capacitie: or where they are not made prouie of the true and secrete cause, of such wonderfull Philosophicall Feates. These men, are of fower sortes, chiefly. The first, I may name, *Vaine prating liue badies*: The second, *Fond Friends*: The third, *Imperiously zelous*: and the fourth, *Malicious Ignorant*. To ech of these (briefly, and in charitie) I will say a word or two, and so returne to my Preface. *Vaine prating liue badies*, vie your idle assemblies, and conferences, otherwise, then in talke of matter, either about your Capacities, for hardnesse: or contrary to your Consciences, in Veritie. *Fond Friends*, leaue of, so to commend your vnacquainted friend, vpon blinde affection: As, because he knoweth more, then the common Student: that, therefore, he must needs be skillfull, and a doer, in such matter and maner, as you terme *Coniuring*. Weening, thereby, you aduance his fame: and that you make other men, great marueilers of your hap, to haue such a learned friend. Cease to ascribe Impiety, where you pretend Amicitie. For, if your tounges were true, then were that your friend, *Vnto*, both to God, and his Soueraigne. Such *Friends* and *Fondlinges*, I shake of, and renounce you: Shake you of, your Folly. *Imperiously zelous*, to you, do I say: that (perhaps) well, do you Meane: But farre you misse the Marke: If a Lambe you will kill, to feede the flocke with his blood. Sheepe, with Lambes blood, haue no naturall sustenance: No more, is Christs flocke, with horrible flanders, duly adidled. Nor your faire pretense, by such rascall ragged Rhetoricke, any whit, well graced. But such, as so vse me, will finde a fowle Cracke in their Credite. Speake that you know: And know, as you ought: Know not, by Heare say, when life lieth in danger. Search to the quicke, & let Charitie be your guide. *Malicious Ignorant*, what shall I say to thee? *Prohibe linguam tuam a malo. Adstrahone parue lingue. Causa thy toung to refraine fro euill. Refraine your toung from flammer*. Though your tounges be sharpened, Serpent like, & Adders poyson lye in your lippes: yet take heede, and thinke, beimes, with your selfe, *Vir linguas non subleuat in terra. Virum violentum venabitur malum, donec prascipitur*. For, sure I am, *Quia facit Dominus Iudicium afflicti: Et vindictam propinquitur*. Thus, I require you, my assured frendes, and Country men (you Mathematicians, Mechanicians, and Philosophers, Charitable and discrete) to deale in my behalfe,

## John Dee his Mathematicall Preface.

behalf, with the light & vntue tounged, my enuious Aduersaries, or Fond friends. And farther, I would wishe, that at leysor, you would consider, how *Basilus Magnus*, layeth *Moses* and *Daniel*, before the eyes of those, which count all such Studies Philosophicall (as mine hath bene) to be vngodly, or vnprouitable. Waye well *Stephen* his witnesse of *Moses*. *Erasmus* et *Moses* omni Sapientia *Aegyptiorum*: *Et erat potens in verbis & operibus suis*. *Moses* was instructed in all manner of wisdom of the *Aegyptians*: and he was of power both in his wordes, and workes. You see this Philosophicall Power & Witdome, which *Moses* had, to be nothing miliked of the Holy Ghost. Yet *Plinius* hath recorded, *Moses* to be a wicked *Magician*. And that (of force) must be, either for this Philosophicall witdome, learned, before his calling to the leading of the Children of *Israel*: or for those his wonders, wrought before King *Pharao*, after he had the conducting of the *Israelites*. As concerning the first, you perceau, how *Stephen*, at his Martyrdome (being full of the Holy Ghost) in his Recapitulation of the olde Testament, hath made mention of *Moses* Philosophie: with good liking of it: And *Basilus Magnus* also, auoucheth it, to haue bene to *Moses* profitable (and therefore, I say, to the Church of God, necessary). But as concerning *Moses* wonders, done before King *Pharao*: God, him selfe, sayd: *Vide ut omnia ostenta, qua posui in manu tua, facias coram Pharaoe*. See that thou do all those wonders before *Pharao*, which I haue put in thy hand. Thus, you evidently perceau, how rashly, *Plinius* hath flandered *Moses*, of vayne fraudulent *Magick*, laying: *Est & alia Magice Falsitas, a Mose, Iamne, & Iatope, Induigendens: sed multis millibus annorum post Zoroastrem &c.* Let all such, therefore, who, in Iudgement and Skill of Philosophie, are farre Inferior to *Plinius*, take good heede, least they ouerhoote them felues rashly, in Iudging of *Philosophers*. *Braunge Ailes*: and the Meanes, how they are done. But, much more, ought they to beware of forging, deuising, and imagining monstrous feates, and wonderfull workes, when and where, no such were done: no, not any sparke or likelihood, of such, as they, without all shame, do report. And (to conclude) most of all, let them be ashamed of Man, and afraide of the dreadfull and Iuste Iudge: both Folly or Maliciously to deuise: and then, deuillishly to father their new fond Monsters on me: Innocent, in hand and hart: for trespassing either against the lawe of God, or Man, in any my Studies or Exercises, Philosophicall, or Mathematicall: As in due time, I hope, will be more manifest.

Now end I, with *Archemastrie*. Which name, is not so new, as this Arte is rare. For an other Arte, vnder this a degree (for skill and power) hath bene indued with this English name before. And yet, this, may serue for our purpose, sufficiently, at this present. This Arte, teacheth to bryng to actual experience sensible, all worthy conclusions by all the Artes Mathematicall purposed, & by true Naturall Philosophie concluded: & both addeh to them a farder scope, in the termes of the same Artes, & also by hys propre Method, and in peculiar termes, procedeth, with helpe of the foresayd Artes, to the performance of complee Experiences, which of no particular Arte, are habile (Formally) to be challenged. If you remember, how we considered *Archithetrie*, in respect of all common handworkes: some light may you haue, thereby, to vnderstand the Souerainety and propriety of this Science. Science I may call it, rather, then an Arte: for the excellency and Masterhypp it hath, ouer so many, and so mighty Artes.

Lib. 36. Cap. 1.

1.

2.

3.

4.

5.

6.

7.

8.

9.

10.

11.

12.

13.

14.

15.

16.

17.

18.

19.

20.

21.

22.

23.

24.



## John Dee his Mathematicall Preface.

Sciences. And bycause it proceedeth by *Experiences*, and searcheth forth the causes of Conclusions, by *Experiences*; and also putteth the Conclusions them selues, in *Experience*, it is named of some, *Scientia Experimentalis*. The *Experimentall Science*. *Nicolas Cusanus* termeth it so, in his *Experimentes Statikali*. And an other *Philosopher*, of this land Natue (the floure of whose worthy fame, can neuer dye nor wither) did write thereof largely, at the request of *Clement the first*. The *Arte* carrieth with it, a wonderfull Credit: By reason, it certifieth, sensibly, fully, and completely to the vtmost power of Nature, and Arte. This *Arte*, certifieth by *Experience* complete and absolute: and other *Artes*, with their Arguments, and Demonstrations, persuaide: and in wordes, proue very well their Conclusions. \* But wordes, and Arguments, are no sensible certifying: nor the full and finall frute of Sciences practicable. And though some *Artes*, haue in them, *Experiences*, yet they are not complete, and brought to the vtmost, they may be stretched vnto, and applyed sensibly. As for example: the Naturall *Philosopher* disputeth and maketh goodly shew of reason: And the *Astronomer*, and the *Opticall Mechanician*, put some thynges in *Experience*: but neither, all, that they may: nor yet sufficiently, and to the vtmost, those, which they do. There, then, the *Archemaster* steppeth in, and leadeth forth on, the *Experience*, by order of his doctrine *Experimental*, to the chief and finall power of Naturall and Mathematicall *Artes*. Of two or three men, in whom, this Description of *Archemastery* was *Experimentally*, verified, I haue read and hard: and good record, is of their such perfection. So that, this *Art*, is no fantastical Imagination: as some *Sophister*, might, *Cum suis Insinuationibus*, make a flourish: and daffell your Imagination: and dash your honest desire and Courage, from beleuing these thynges, so vnheard of, so meruaylous, & of such Importance. Well: as you will. I haue forewarned you. I haue done the part of a frende: I haue discharged my Duty toward God: for my small Talent, at his most mercifull handes received. To this Science, doth the Science *Alchimicall*, great Service. Mufe nothing of this name. I chaunge not the name, so vnto, and in Print published by other: beying a name, propre to the Science. Vnder this, commeth *Art Sintrillia*, by *Arctophilus*, briefly written. But the chief Science, of the *Archemaster*, (in this world) as yet known, is an other (as it were) *OPTICALL Science*: whereof, the name shall be told (God willing) when I shall haue some, (more iust) occasion, therof, to Discourse.

Here, I must end, thus abruptly (Gentle frende, and vnspayed louer of honest and necessary verities). For, they, who haue (for your sake, and vertues cause) requested me, (an old forborne Mathematicien) to take pen in hand: (through the confidence they reposed in my long experience: and tried sincerity) for the declaring and reportyng somewhat, of the frute and commodity, by the *Artes Mathematicall*, to be attayned vnto: euen they, Sore agaynst their willes, are forced, for sundry causes, to satisfie the workemans request, in endyng forthwith: He, so feareth this, so new an attempt, & so costly: And in matter so slenderly (heretofore) among the common Sorte of Studentes, considered or esteemed.

And where I was willed, somewhat to alledge, why, in our vulgare Speche, this part of the Principall Science of *Geometrie*, called *Euclides Geometrical Elementes*, is published, to their handling: being vnlatined people, and not Vniuersitie Scholars: Verily, I thinke it needefull.

For, the Honour, and Estimation of the Vniuersities, and Graduates, is, hereby, nothing diminished. Seing, from, and by their Nurse Children, you receaue all this Benefite: how great fouer it be.

Neither

## John Dee his Mathematicall Preface.

fight agaynst myne owne shadowe. For, no man (I am sure) will open his mouth agaynst this Interperse. No man (I say) who either hath Charitie toward his brother (and would be glad of his furtherance in vertuous knowledge): or that hath any care & zeale for the bettering of the Common State of this Realme. Neither any, that make account, what the wiser sort of men (Sage and Stayed) do thinke of them. To none (therefore) will I make any *Apologie*, for a vertuous acte doing: and for commending, or setting forth, Profitable *Artes* to English men, in the English tounge. But, vnto God our Creator, let vs all be thankfull: for that, *As he, of his Goodnes, by his Powre, and in his wisdom, hath Created all thynges, in Number, Weight, and Measure*: So, to vs, of his great Mercy, he hath reuealed Meanes, whereby, to attayne the sufficient and necessary knowledge of the foresayd his three principall Instrumetes: Which Meanes, I haue abundantly proued vnto you, to be the *Sciences* and *Artes Mathematicall*.

And though I haue ben pinched with straightnes of tyme: that, no way, I could so pen downe the matter (in my Mynde) as I determined: hoping of conuenient layfure: Yet, if vertuous zeale, and honest Intent prouoke and bryng you to the reading and examining of this Compendious treatise, I do not doute, but, as the vertie therof, accordyng to our purpose, will be euident vnto you: So the pith and force therof, will persuaide you: and the wonderfull frute therof, highly pleasure you. And that you may the easier perceiue, and better remember, the principall pointes, whereof my Preface treateth, I will giue you the Groundplatt of my whole discourse, in a Table annexed: from the first to the last, somewhat Methodically contriued.

The Ground  
platt of this  
Preface in a  
Table.

If Haste, hath caused my poore pen, any where, to stumble: You will, (I am sure) in part of recompence, (for my earnest and sincere good will to please you), Consider the rockish huge mountaines, and the perillous vnbeaten wayes, which (both night and day, for the while) it hath toyled and labored through, to bryng you this good

Newes, and Comfortable profe, of Vertues frute.

So, I Commit you vnto Gods Mercyfull direction, for the rest: hartely beseeching hym, to prosper your Snydes, and honest Intentces: to his Glory, & the Commodity of our Countrey. Amen.

Written at my poore Houfe  
At Mortlake.

Anno. 1578. February. 9.



## John Dee his Mathematicall Preface.

Neither are their Studies, hereby, any whit hindered. No more, then the Italian Vniuersities, as *Academia Bononiensis, Ferrariensis, Florentina, Mediolanensis, Patana, Papiensis, Perusina, Pisana, Romana, Senensis*, or any one of them, finde them selues, any deale, disgraced, or their Studies any thing hindered, by *Frater Luca de Burgo*, or by *Nicolas Tartalea*, who in vulgar Italian language, haue published, not only *Euclides Geometrie*, but of *Archimedes* somewhat: and in Arithmetike and Practicall Geometrie, very large volumes, all in their vulgar speche. Nor in Germany haue the famous Vniuersities, any thing bene discontent with *Albertus Durerus*, his Geometrical Institutions in Dutch: or with *Gulielmus Xylander*, his learned translation of the first sixe booke of *Euclide*, out of the Greke into the high Dutch. Nor with *Gualterus H. Riffius*, his Geometrical Volume: very diligently translated into the high Dutch tounge, and published. Nor yet the Vniuersities of Spaine, or Portugal, thinke their reputation to be decayed: or suppose any their Studies to be hindered by the Excellent *P. Nennius*, his Mathematicall workes, in vulgare speche by him put forth. Haue you not, likewise, in the French tounge, the whole Mathematicall Quadriue? and yet neither Paris, Orleans, or any of the other Vniuersities of Fraunce, at any time, with the Translators, or Publishers offended: or any mans Studie thereby hindered?

And surely, the Common and Vulgar Scholer (much more, the Gramarian) before his conning to the Vniuersitie, shall (or may) be, now (accordyng to Plato his Counsell) sufficiently instructed in *Arithmetike* and *Geometrie*, for the better and easier learning of all manner of *Philosophie, Academical*, or *Peripateticall*. And by that meanes, grow more cherfully, more skilfully, and speedily forward, in his Studies, there to be learned. And, so, in lesse tyme, profite more, then (otherwise) he should, or could do.

Allo many good and pregnant Englishe wittes, of young Gentlemen, and of other, who neuer intend to meddle with the profound search and Studie of Philosophie (in the Vniuersities to be learned) may neuerthelesse, now, with more ease and libertie, haue good occasion, virtuously to occupie the sharpnesse of their wittes: where, els (perchance) otherwise, they would in fond exercises, spend (or rather leese) their time: neither seruing God: nor fundering the Weale, common or priuate.

And great Comfort, with good hope, may the Vniuersities haue, by reason of this Englishe Geometrie, and Mathematicall Preface, that they (hereafter) shall be the more regarded, esteemed, and resorted vnto. For, when it shall be known and reported, that of the *Mathematicall Sciences* onely, such great Commodities are ensuing (as I haue specified): and that in dede, some of you vnlatined Studentes, can be good winckle, of such rare frute by you enioyed (thereby): as either, before this, was not heard of: or els, not so fully credited: Well, may all men coniecture, that farre greater ayde, and better furniture, to winne to the Perfection of all Philosophie, may in the Vniuersities be had: being the Storehouses & Threasures of all Sciences, and all Artes, necessary for the best, and most noble State of Common Wealthes.

Besides this, how many a Common Artificer, is there, in these Realmes of England and Ireland, that dealeth with Numbers, Rule, & Cumpasse: Who, with their owne Skill and experience, already had, will be hable (by these good helpes and informations) to finde out, and deuise, new workes, strange Engines, and Instrumetes: for sundry purposes in the Common Wealth? or for priuate pleasure? and for the better maintayning of their owne estate? I will not (therefore):

A. iiii. fight



☞ The Translator to the Reader.



Here is (gentle Reader) nothing (the word of God onely set apart) which so much beautifieth and adorneth the soule and minde of mā, as doth the knowledge of good artes and sciences: as the knowledge of naturall and morall Philosophie. The one setteth before our eyes, the creatures of God, both in the heauens above, and in the earth beneath: in which as in a glasse, we beholde the exceeding maiestie and wisdom of God, in adorning and beautifying them as we see: in geuing vnto them such wonderfull and manifold proprieties, and naturall workings, and that so diuersly and in such varietie: farther in maintaining and conseruing them continually, whereby to praise and adore him, as by S. Paule we are taught. The other teacheth vs rules and preceptes of vertue, how, in common life amongest men, we ought to walke vprightly: what duties pertaine to our selues, what pertaine to the gouernment or good order both of an housholde, and also of a citie or common wealth. The reading likewise of histories, conduceth not a litle, to the adorning of the soule & minde of man, a studie of all men comended: by it are seene and known the artes and doings of infinite wise men gone before vs. In histories are contained infinite examples of heroicall vertues to be of vs followed, and horrible examples of vices to be of vs eschewed. Many other artes also there are which beautifie the minde of man: but of all other none do more garnishe & beautifie it, then those artes which are called Mathematicall. Vnto the knowledge of which no man can attaine, without the perfect knowledge and instruction of the principles, groundes, and Elementes of Geometrie. But perfectly

☞.ii.

☞ The Translator to the Reader.

well perceauē. The fruite and gaine which I require for these my paines and trauaile, shall be nothing els, but onely that thou gentle reader, will gratefully accept the same: and that thou mayest thereby receaue some profite: and moreover to excite and stirre vp others learned, to do the like, & to take paines in that behalfe. By meanes wherof, our English tongue shall no lesse be enriched with good Authors, then are other straunge tongues: as the Dutch, French, Italian, and Spanishe: in which are red all good authors in a maner, found amongest the Grekes or Latines. Which is the chiefe cause, that amongest the doctouris so many cunning and skilfull men, in the inuentions of straunge and wonderfull thinges, as in these our daies we see there do. Which fruite and gaine if I attaine vnto, it shall encourage me hereafter, in such like sort to translate, and set abroad some other good authors, both pertaining to religion (as partly I haue already done) and also pertaining to the Mathematicall Artes. Thus gentle reader farewell.

(?)

☞.ii.

☞ The Translator to the Reader.

fectly to be instructed in them, requireth diligent studie and reading of olde auncient authors. Amongest which, none for a beginner is to be preferred before the most auncient Philosopher Euclide of Megara. For of all others he hath in a true methode and iuste order, gathered together whatsoever any before him had of these Elementes written: inuenting also and adding many thinges of his owne: whereby he hath in due forme accomplished the arte: first geuing definitions, principles, & groundes, wherof he deduceth his Propositions or conclusions, in such wonderfull wise, that that which goeth before, is of necessitie required to the proufe, of that which followeth. So that without the diligent studie of Euclides Elementes, it is impossible to attaine vnto the perfecte knowledge of Geometrie, and consequently of any of the other Mathematicall sciences. Wherefore considering the want & lacke of such good authors hitherto in our English tongue, lamenting also the negligence, and lacke of zeale to their country in those of our nation, to whom God hath geuen both knowledge, & also abilitie to translate into our tongue, and to publishe abroad such good authors, and bookes (the chiefe instruments of all learninges): seeing moreover that many good wittes both of gentlemen and of others of all degrees, much desirous and studious of these artes, and seeking for them as much as they can, sparing no paines, and yet frustrate of their intent, by no meanes attaining to that which they seeke: I haue for their sakes, with some charge & great trauaile, faithfully translated into our vulgare tongue, & set abroad in Print, this booke of Euclide. Whereunto I haue added easie and plaine declarations and examples by figures, of the definitions. In which booke also ye shall in due place finde manifold additions, Scholies, Annotations, and Inuentions: which I haue gathered out of many of the most famous & chiefe Mathematicians, both of old time, and in our age: as by diligent reading it in course, ye shall well





# The first booke of Euclides Elementes.



IN THIS FIRST BOOKE is intreated of the most simple, easie, and first matters and groundes of Geometry, as, namely, of Lynes, Angles, Triangles, Parallels, Squares, and Parallelogrammes. First of their definitions, shewyng what they are. After that it teacheth how to draw Parallel lynes, and how to forme diuersly figures of three sides, & foure sides, according to the varietie of their sides, and Angles: & cōparetir them all with Triangles, & also together the one with the other. In it also is taught how a figure of any forme may be chaūged into a Figure of an other forme. And for that it entreateth of these most common

*The argument of the first Booke.*

and generall thynges, this booke is more vniuersall then is the seconde, third, or any other, and therefore iustly occupieth the first place in order: as that without which, the other bookes of *Euclide* which follow, and also the workes of others which haue written in Geometry, cannot be perceaued nor vnderstanded. And forasmuch as all the demonstrations and proofes of all the propositions in this whole booke, depende of these groundes and principles following, which by reason of their playnnes neede no greate declaration, yet to remoue all (be it neuer so litle) obscuritie, there are here set certayne shorte and manifest expositions of them.

## Definitions.

### 1. A signe or point is that, which hath no part.

*Definition of a poynt.*

The better to vnderstand what maner of thing a signe or point is, ye must note that the nature and propriete of quantitie (wherof Geometry entreateth) is to be deuided, so that whatsoeuer may be deuided into sundry partes, is called quantitie. But a point, although it pertaine to quantitie, and hath his beyng in quantitie, yet is it no quantitie, for that it cannot be deuided. Because (as the definition saith) it hath no partes into which it should be deuided. So that a point is the least thing that by minde and vnderstanding can be imagined and conceyued: then which, there can be nothing lesse, as the point *A* in the margent.

*A.*

A signe or point is of *Pithagoras* Scholers after this manner defined: *A poynt is an vnitie which hath position.* Nūbers are conceaued in mynde without any forme & figure, and therefore without matter wheron to receaue figure, & consequently without place and position. Wherefore vnitie beyng a part of number, hath no position, or determinate place. Whereby it is manifest, that number is more simple and pure then is magnitude, and also immateriall: and so vnity which is the beginning of number, is lesse materiall then a signe or poynt, which is the beginnyng of magnitude. For a poynt is materiall, and requireth position and place, and thereby differeth from vnitie.

*Definition of a poynt after Pithagoras.*

### 2. A line is length without breadth.

*Definition of a line.*

There pertaine to quantitie three dimensions, length, bredth, & thicknes, or depth: and by these three are all quantities measured & made known. There are also, according

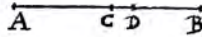
*B. j.*

*to*



## The first Booke

to these three dimensions, three kyndes of continuall quantities: a lyne, a superficies, or plaine, and a body. The first kynde, namely, a line is here defined in these wordes, *A lyne is length without breadth.* A point, for that it is no quantitie nor hath any partes into which it may be deuided, but remaineth indiuisible, hath not, nor can haue any of these three dimensions. It neither hath length, breadth, nor thickenes. But to a line, which is the first kynde of quantitie, is attributed the first dimension, namely, length, and onely that, for it hath neither breadth nor thicknes, but is conceaued to be drawne in length onely, and by it, it may be deuided into partes as many as ye list, equall, or vnequall. But as touching breadth it remaineth indiuisible. As the lyne *AB*, which is onely drawne in length, may be deuided in the pointe *C* equally, or in the pointe *D* vnequally, and so into as many partes as ye list. There are also of diuers other geuen other definitions of a lyne: as



*An other definition of a line.*  
*An other.*

*A lyne is the mouyng of a poynte, as the motion or draught of a pinne or a penne to your fence maketh a lyne.*

Agayne, *A lyne is a magnitude hauing one onely space or dimension, namely, length wantyng breadth and thicknes.*

*The endes of a line.*

### 3 The endes or limites of a lyne, are pointes.

For a line hath his beginning from a point, and likewise endeth in a point: so that by this also it is manifest, that pointes, for their simplicitie and lacke of composition, are neither quantitie, nor partes of quantitie, but only the termes and endes of quantitie. As the pointes *A, B*, are onely the endes of the line *AB*, and no partes thereof, And herein differeth a poynte in quantitie, from vnitie in number: for that although vnitie be the beginning of numbers, and no number (as a point is the beginning of quantitie, and no quantitie) yet is vnitie a part of number. For number is nothyng els but a collection of vnities, and therefore may be deuided into them, as into his partes. But a point is no part of quantitie, or of a lyne: neither is a lyne composed of pointes, as number is of vnities. For things indiuisible being neuer so many added together, can neuer make a thing diuisible, as an instant in time, is neither tyme, nor part of tyme, but only the beginning and end of time, and coupleth & ioyneth partes of tyme together.



*Difference of a point frō Vnity.*  
*Vnity is a part of number.*

*A poynt is no part of quantitie.*

*Definition of a right line.*

### 4 A right lyne is that which lieth equally betwene his pointes.

As the whole line *AB* lyeth straight and equally betwene the poyntes *AB* without any going vp or coming downe on eyther side.

*Definition of a right line after Campanus.*  
*Definition thereof after Archimedes.*

*Campanus* and certain others, define a right line thus: *A right line is the shortest extension or draught, that is or may be from one poynt to an other.* *Archimedes* defineth it thus.

*A right line is the shortest of all lines, which haue one and the self same limites or endes: which is in maner al one with the definitiō of Campanus.* As of all these lines *ABC, ADC, AEC, AFC*, which are all drawn from the point *A*, to the poynte *B*, as *Campanus* speake th, or which haue the self same limites or endes, as *Archimedes* speake th, the lyne *ABC*, beyng a right line, is the shortest.



*Definition thereof after Plato.*

*Plato* defineth a right line after this maner: *A right line is that whose middle part shadoweth the extremes.* As if you put any thyng in the middle of a right lyne, you shall not see from the one end to the other, which thyng happeneth not in a crooked lyne. The Eclipse of the Sunne (say *Altronomers*) then happeneth, when the Sunne, the Moone, & our eye are in one right line. For the Moone then being in the midft betwene vs and the Sunne, causeth it to be darkened. Diuers other define a right line diuersly, as followeth.

*An other definition.*  
*An other.*

*A right lyne is that which standeth firme betwene his extremes.*

Agayne, *A right line is that which with an other line of lyke forme cannot make a figure.*  
Agayne,



Agayne, *A right lyne is that which hath not one part in a plaine superficies, and an other crested on high.* *An other.*

Agayne, *A right lyne is that, all whose partes agree together with all his other partes.*

Agayne, *A right lyne is that, whose extremes abiding, cannot be altered.*

Euclide doth not here define a crooked lyne, for it neded not. It may easely be vnderstand by the definition of a right lyne, for euery contrary is well manifested & set forth by hys contrary. One crooked lyne may be more crooked then an other, and from one poynt to an other may be drawn infinite crooked lynes: but one right lyne cannot be righter then an other, and therefore from one point to an other, there may be drawn but one right lyne. As by the figure about set, you may see.

*An other.*

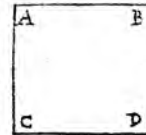
*An other.*

*Why Euclide here defineth not a crooked lyne.*

### 5 A superficies is that, which hath onely length and breadth.

*Definition of a superficies.*

A superficies is the second kinde of quantitie, and to it are attributed two dimensions, namely length, and breadth. As in the superficies *ABCD*, whose length is taken by the lyne *AB*, or *CD*, and breadth by the lyne *AC*, or *BD*: and by reason of those two dimensions a superficies may be deuided two wayes, namely by his length, and by hys breadth, but not by thickeesse, for it hath none. For, that is attributed onely to a body, which is the third kynde of quantitie, and hath all three dimensions, length, breadth, and thickeesse, and may be deuided according to any of them.



*A superficies may be deuided two wayes.*

Others define a superficies thus: *A superficies is the terme or ende of a body.* As a line is the ende and terme of a superficies.

*Another definition of a superficies.*

*The extremes of a superficies.*

### 6 Extremes of a superficies, are lynes.

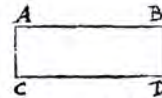
As the endes, limites, or borders of a lyne, are pointes, inclosing the line: so are lines the limites, borders, and endes inclosing a superficies. As in the figure afore sayde you may see the superficies inclosed with foure lynes. The extremes or limites of a body, are superficieses. And therefore a superficies is of some thus defined: *A superficies is that, which endeth or incloseth a body:* as is to be seene in the sides of a die, or of any other body.

*Another definition of a superficies.*

### 7 A plaine superficies is that, which lieth equally betwene his lines.

*Definition of a plaine superficies.*

As the superficies *ABCD* lyeth equally and smoothe betwene the two lines *AB*, and *CD*: or betwene the two lines *AC*, and *BD*: so that no part thereof cyther swelleth vpward, or is depressed downward. And this definition much agreeth with the definition of a right line. A right line lieth equally betwene his points, and a plaine superficies lyeth equally betwene his lynes. Others define a plaine superficies after this maner:



*A plaine superficies, is the shortest extension or draught from one lyne to an other: like as a right lyne is the shortest extension or draught from one point to an other.*

*Another definition of a plaine superficies.*

Euclide also leaueth out here to speake of a crooked and hollow superficies, because it may easely be vnderstand by the definition of a plaine superficies, being hys contrary. And euen as from one point to an other may be drawn infinite crooked lines, & but one right line, which is the shortest: so from one lyne to an other may be drawn infinite crooked superficieses, & but one plaine superficies, which is the shortest. Here must you consider when there is in Geometry mention made of pointes, lines, circles, triangles, or of any other figures, ye may not conceyue of them as they be in matter, as in woode, in mettall, in paper, or in any such lyke, for so is there no lyne, but hath some breadth, and may be deuided: nor points, but that shal haue some partes, and may also be deuided, and so of others. But you must conceiue them in mynde, plucking them by imagination from all matter, so shall ye vnderstande them truly and perfectly, in their owne nature as they are defined. As a lyne to be long, and not broad: and a poynte to

*NOT E.*

I. ij.

bc



*Flussas, of mixt and*

**A briefe treatise, added by Flussas, of mixt and composed regular solides.**



Regular solides are sayd to be composed and mixt, when ech of them is transformed into other solides, keeping still the forme, number, and inclination of the bafes, which they before had one to the other: some of which yet are transformed into mixt solides, and other some into simple. Into mixt, as a Dodecahedron and an Icosahedron: which are transformed or altered, if ye diuide their sides into two equall partes, and take away the folide angles subtended of plaine superficiall figures made by the lines coupling those middle sections: for the folide remayning after the taking away of those folide angles, is called an Icosidodecahedron. If ye diuide the sides of a cube and of an Octohedron into two equall partes, and couple the sections, the folide angles subtended of the plaine superficieses made by the coupling lines, being taken away, there shall be left a folide, which is called an Exoctohedron. So that both of a Dodecahedron and also of an Icosahedron, the folide which is made, shall be called an Icosidodecahedron: and likewise the folide made of a Cube & also of an Octohedron, shall be called an Exoctohedron. But the other folide, namely a Pyramis (or Tetrahedron) is transformed into a simple folide: for if ye diuide into two equall partes every one of the sides of the pyramis, triangles described of the lines which couple the sections, and subtending, and taking away folide angles of the pyramis, are equal and like vnto the equilateral triangles left in every one of the bafes: of all which triangles is produced an Octohedron, namely, a simple and not a composed folide. For the Octohedron hath fewer bafes, like in number, forme, and mutuall inclination with the bafes of the pyramis: and hath the other fewer bafes with like situation opposite and parallel to the former. Wherefore the application of the pyramis taken twise, maketh a simple Octohedron, as the other solides make a mixt compound folide.

*Icosidodecahedron.*

*Exoctohedron.*

*¶ First Definition.*

An Exoctohedron is a folide figure contained of sixe equall squares, and eight equilateral and equall triangles.

*¶ Second Definition.*

An Icosidodecahedron is a folide figure, contained vnder twelve equilateral equall and equiangle Pentagons, and twentie equall and equilateral triangles.

For the better vnderstanding of the two former definitions, and also of the two Propositions following, I haue here set two figures, whose formes, if ye first describe

*Flussas, of mixt and*

in the bafes of the cube, be squares: and they shall be fixe in number, according to the number of the bafes of the cube.

Agayne forasmuch as the triangle KIN subtendeth the folide angle D of the cube, and likewise the triangle KGL the folide angle C, & so the rest, which subtend the eight folide angles of the cube: and these triangles are equall and equilateral, namely, being made of equall sides & they are the limmits or borders of the squares, and the squares the limmits or borders of the, as hath before bene proued: wherefore LMNOPHGK is an exoctohedron, by the definition, and is equilateral, for it is contained of equall subtendent lines: it is also equiangle, for every folide angle thereof, is contained vnder two superficiall angles of two squares, and two superficiall angles of two equilateral triangles.

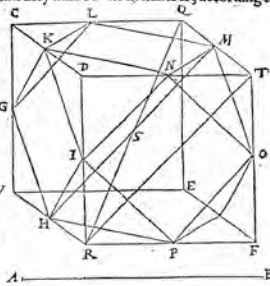
And now forasmuch as the opposite sides and diameters of the bafes of the cube are parallels, the playne extended by the right lines QT, VR, shall be a parallelogramme. And for that also in that playne lyeth QR the diameter of the cube, and in the same playne also is the line MH, which diuideth the sayd playne into two equall partes, and also coupleth the opposite angles of the exoctohedron this line MH therefore diuideth the diameter into two equall partes, by the collary of the 34. of the first, and also diuideth it selfe in the same poynt, which let be S, into two equall partes, by the 4. of the first. And by the same reason may we proue that the rest of the lines, which couple the opposite angles of the exoctohedron, doo in S the centre of the cube diuide the one the other into two equall partes. For every one of the angles of the exoctohedron are set in every one of the bafes of the cube. Wherefore making the centre the poynt S, and the space SH or SM; describe a sphere, and it shall touch every one of the angles equidistant from the poynts.

And forasmuch as AB the diameter of the sphere geuen, is put equal to the diameter of the cube, namely, to the line RT, and the same line RT is equall to the line MH, by the 33. of the first: which line MH coupling the opposite angles of the exoctohedron, is drawne by the centre: wherefore it is the diameter of the sphere geuen which conyareth the exoctohedron.

Finally forasmuch as in the triangle RFT, the line PO doth cutte the sides into two equall partes, it shall cutte them proportionally with the bafes, namely, as FR is to FP, so shall RT be to PO, by the 2. of the sixth. But FR is double to FP, by the position: wherefore RT, or the diameter HM, is also double to the line PO the side of the exoctohedron. Wherefore we haue described an equilateral & equiangle exoctohedron, and comprehended it in a sphere geuen, and haue proued that the diameter of the sphere is double to the side of the exoctohedron.

*That the exoctohedron is contained in a sphere.*

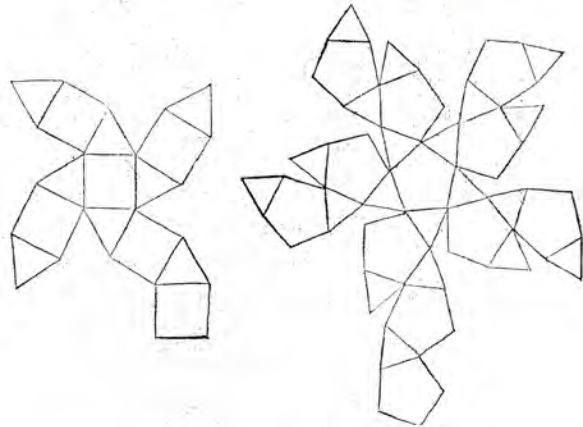
*That the diameter of the sphere is double to the side of the exoctohedron.*



*composed regular solides.*

**Fol. 459.**

describe vpon pasted paper or such like matter, and then cut them and folde them accordingly, they will represent vnto you the perfect formes of an Exoctohedron and of an Icosidodecahedron.



*¶ The first Probleme.*

To describe an equilateral and equiangle exoctohedron, and to contayne it in a sphere geuen: and to proue that the diameter of the sphere is double to the side of the sayd exoctohedron.



Vppose that there be a sphere geuen, whose diameter let be AB. And about the diameter AB let there be described a square by the sixth of the fourth: and vpon the square let there be described a cube by the 15. of the thirteenth: which let be CDEFGHTVR: and let the diameter thereof be QR, and the centre S. And diuide the sides of the cube into two equall partes in the poyntes G, H, I, K, L, M, N, O, P, &c. And couple the middle sections by the right lines IN, N, O, O, P, P, I and such like, which subtend the angles of the squares or bafes of the cube: and they are equal by the 4. first, and containe right angles, as the angle NIP. For the angle NID which is at the bafe of the isosceles triangle NDI, is the halfe of a right angle, and so likewise is the opposite angle RIP. Wherefore the residue NIP is a right angle, and so the rest. Wherefore NIP-O is a square. And by the same reason shall the rest NM, LK, K, G, HI &c. inscribed DDD.ij.

*Construction of the exoctohedron.*

*composed regular solides.*

**Fol. 460.**

*¶ The 2. Probleme.*

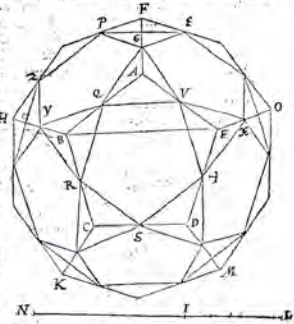
To describe an equilateral & equiangle Icosidodecahedron, & to comprehend it in a sphere geuen: and to proue that the diameter being diuided by an extreme and meane proportion, maketh the greater segment double to the side of the Icosidodecahedron.



Vppose that the diameter of the sphere geuen be NL, and (by the 30. of the sixth) diuide the line NL by an extreme and meane proportion in the poynt I: and the greater segment thereof let be NI. And vpon the line NI describe a cube by the 15. of the thirteenth: and about this cube let there be circumscribed a dodecahedron, by the 17. of the thirteenth: & let the same be ABCDEFGHKMO.

And diuide every one of the sides into two equall partes in the poynts Q, R, S, T, V, X, Y, Z, P, &c. &c. and couple the sections with right lines, which shall subtend the angles of the pentagons, as the lines P, G, G, V, V, Q, Q, Y, Y, R, R, Q, V, T, T, X, X, V, and so the rest. Now forasmuch as these lines subtend equall angles of the pentagons, and those equall angles are contained of equall sides (namely of the halves of the sides of the pentagons): therefore those subtending lines are equal, by the 4. of the first. Wherefore the triangles G-Q, Y, Q, B, V, X, T, and the rest which take away folide angles of the dodecahedron, are equilateral. Agayne forasmuch as in every pentagon are described five equall right lines, coupling the middle sections of the sides, as the lines Q, Y, V, T, T, S, R, R, Q: they describe a pentagon in the playne of the pentagon of the dodecahedron: and the sayd pentagon is contained in a circle, namely, whose centre is the centre of a pentagon of the dodecahedron. For the lines drawne from that centre to the angles of this pentagon are equal, for that they are perpendiculars vpon the bafes cutte, by the 12. of the fourth. Wherefore the pentagon QRSTV is equilateral, by the 11. of the same. And by the same reason may the rest of the pentagons described in the bafes of the dodecahedron be proued equall and like. Wherefore those pentagons are 12. in number: And forasmuch as the equall and like triangles, doo subtend and take away 20. folide angles of the dodecahedron, therefore the sayd triangles shall be 20. in number. Wherefore we haue described an Icosidodecahedron by the definition, which Icosidodecahedron is equilateral, for that all the sides of the triangles are equal & common with the pentagons: and it is also equiangle: For every one of the folide angles is made of two superficiall angles of an equilateral pentagon, and of two superficiall angles of an equilateral triangle. DDD.ij.

*Construction of the Icosidodecahedron.*



*The*



That the Icofododecahedron is containd in the Sphere geuen.

Now let vs proue that it is containd in the Sphere geuen, whose diameter is N L. Forasmuch as perpendiculars drawn fro the centres of the Dodecahedron, to the middle sections of his sides, are the halves of the lines, which couple the opposite middle sections of the sides of the Dodecahedron, by the 3. Corollary of the 17. of the thirteenth: which lines also, by the same Corollary, do in the centre diuide the one the other into two equal partes: therefore right lines drawn from that point to the angles of the Icofododecahedron (which are set in those middle sections) are equal: which lines are 30. in number according to the number of the sides of the Dodecahedron: for every one of the angles of the Icofododecahedron are set in the middle sections of every one of the sides of the Dodecahedron. Wherefore making the centre the centre of the Dodecahedron, and the space any one of the lines drawn from the centre, to the middle sections, describe a Sphere, and it shall passe by all the angles of the Icofododecahedron, and shall containe it.

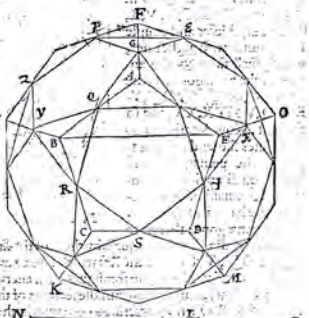
And forasmuch as the diameter of this solide, is that right line, whose greater segment is the side of the cube inscribed in the Dodecahedron, by the 4. Corollary of the 17. of the thirteenth, which side is N I, by supposition. Wherefore that solide is containd in the Sphere geuen whose diameter is put to be the line N L.

That the diameter being diuided by an extreme and meane proportion.

Now let vs proue that the greater segment of the diameter is dupe to Q V the side of this solide. Forasmuch as the sides of the triangle A E B are in the pointes Q and V diuided into two equal partes, the lines Q V and B E are parallels, by the Corollary of the 39. of the first. Wherefore as A E is to A V, so is E B to V Q, by the 2. of the sixth. But the line A E is double to the line A V. Wherefore the line B E is double to the line Q V, by the 4. of the sixth. Now the line B E is equal to N I, or to the side of the cube, by the 3. Corollary of the 17. of the thirteenth, which line N I is the greater segment of the diameter N L. Wherefore the greater segment of the diameter geuen, is double to the side of the Icofododecahedron inscribed in the Sphere geuen. Wherefore we haue described an equilateral and equiangle Icofododecahedron, and containd it in a Sphere geuen, and haue proued that the diameter thereof being diuided by an extreme and meane proportion, maketh hys greater segment double to the side of the Icofododecahedron.

¶ An aduertisement of Flusas.

To the vnderstanding of the nature of this Icofododecahedron, ye must well conceaue the passions and properties of both those solidēs, of whose bāses it consisteth, namely of the Icofahedron and of the Dodecahedron. And although in it the



the bāses are placed oppositely, yet haue they one to the other one of the same inclination. By reason whereof therelie hidden in it the actions and passions of the other regular solidēs. And I would haue thought it not impertinent to the purpose to haue set forth the inscriptions and circumscriptions of this solide, if want of time had not hindered. But to the end the reader may the better attaine to the vnderstanding thereof, I haue here following briefly set forth, how it may in or about eury one of the five regular solidēs be inscribed or circumscribed: by the helpe whereof he may, with small trouble or rather none at all, so that he haue well peyed and considered the demonstrations pertaining to the foresayd five regular solidēs, demonstrate both the inscription of the sayd solidēs in it, and the inscription of it in the sayd solidēs.

¶ Of the inscriptions and circumscriptions of an Icofododecahedron.

An Icofododecahedron may containe the other five regular bodies. For it will receaue the angles of a Dodecahedron, in the centres of the triangles which subtend the solide angles of the Dodecahedron: which solide angles are 30. in number, and are placed in the same order in which the solide angles of the Dodecahedron taken away or subtended by them are. And by that reason it shall receaue a Cube and a Pyramid containd in the Dodecahedron: when as the angles of the one are set in the angles of the other.

An Icofododecahedron receaue an Octohedron, in the angles cutting the fixe opposite sections of the Dodecahedron, euen as if it were a simple Dodecahedron.

And it containeth an Icofahedron, placing the 12. angles of the Icofahedron in the selfe same centres of the 12. Pentagons.

It may also by the same reason be inscribed in eury one of the five regular bodies: namely in a Pyramid, if ye place 4. triangular bāses concentricall with 4. bāses of the Pyramid after the same manner, that ye inscribed an Icofahedron in a Pyramid. So likewise may it be inscribed in an Octohedron, if ye make 8. bāses thereof concentricall with the 8. bāses of the Octohedron. It shall also be inscribed in a Cube, if ye place the angles which receaue the Octohedron inscribed in it, in the centres of the bāses of the Cube. Moreover, ye shall inscribe it in an Icofahedron, when the triangles compased in of the Pentagon bāses, are concentricall with the triangles, which make a solide angle of the Icofahedron. Finally, it shall be inscribed in a Dodecahedron, if ye place eury one of the angles thereof in the middle sections of the sides of the Dodecahedron, according to the order of the construction thereof.

The opposite plaine superficieses also of this solide are parallels. For the opposite solide angles are subtended of parallel plaine superficieses, as well in the angles of the Dodecahedron subtended by triangles, as in the angles of the Icofahedron subtended of Pentagons, which thing may easily be demonstrated. Moreover in this solide are infinite properties & passions, springing of the solidēs whereof it is compased.

Wherefore it is manifest that a Dodecahedron & an Icofahedron, mixed, are transformed

Flusas, of mixt and

compōsed regular solidēs.

Fol 462.

compōsed regular solidēs.

Fol 463.

transformed into one & the selfe same solide of an Icofododecahedron: A cube also, and an octohedron created and altered into another solide, namely into one and the same Exohedron. But a pyramid is transformed into a simple and perfect solide, namely into an Octohedron.

If we will name these two solidēs ioyned together into one solide, this onely must we observe.

In the pentagon of a dodecahedron inscribed a like pentagon, so that the angles of the pentagon inscribed be in the middle sections of the sides of the pentagon circumscribed, and then upon the said pentagon inscribed, let there be set a solide angle of an Icofahedron; and also obiect the selfe same order in eury one of the bāses of the Dodecahedron: and the solide angles of the Icofahedron, set vpon these pentagons shall produce a solide consisting of the whole Dodecahedron, and of the whole Icofahedron. In like sort, if in eury bāse of the Icofahedron, the sides being diuided into two equal partes, be inscribed an equilateral triangle, and vpon eury one of those equilateral triangles be set a solide angle of a Dodecahedron: there shall be produced the selfe same solide consisting of the whole Icofahedron, & of the whole Dodecahedron.

And after the same order, if in the bāses of a cube, be inscribed triangles subtending the solide angles of an Octohedron: or in the bāses of an Octohedron, be inscribed equilateral triangles subtending the solide angles of a cube: there shall be produced a solide consisting of either of the whole solidēs, namely of the whole cube and of the whole Octohedron.

But equilateral triangles inscribed in the bāses of a pyramid, hauing their angles set in the middle sections of the sides of the pyramid, and the solide angles of a pyramid set vpon the sayd equilateral triangles, there shall be produced a solide, consisting of two equal and like pyramids.

And now if in these solidēs thus compased, we take away the solide angles, there shall be reioyned againe the first compased solidēs: namely the solide angles taken away from a Dodecahedron and an Icofahedron compased into one, there shall be left an Icofododecahedron: the solide angles take away from a cube, and an octohedron compased into one solide, there shall be left an octohedron. Moreover the solide angles taken away from two pyramids compased into one solide, there shall be left an Octohedron.

And after this sort, these certain passions and properties of the five simple regular bodies, which although they demonstrate not, yet are they not hard to be demonstrated, if we well pease and conceiue that, which in the former bookes hath beene taught touching those solidēs.

Of the nature of a trilater and equilateral Pyramid.

A trilater equilateral Pyramid is diuided into two equal partes, by three equal squares, which is the centre of the pyramid cutte the one the other into two equal partes, and perpendicularly, and whose angles are set in the middle sections of the sides of the pyramid. From a pyramid are taken away 4. pyramids like vnto the whole, which utterly take away the sides of the pyramid, and that which is left

is an octohedron inscribed in the pyramid in which all the solidēs inscribed in the pyramid are contained. A perpendicular drawne from the angle of the pyramid to the bāse, is double to the diameter of the cube inscribed in it. And a right line coupling the middle sections of the opposite sides of the pyramid, is triple to the side of the selfe same cube. The side also of the pyramid is triple to the diameter of the bāse of the cube. Wherefore the same side of the pyramid is in power dupe to the right line which coupleth the middle sections of the opposite sides. And it is in power less quadruple to the perpendicular which is drawne from the angle to the bāse. Wherefore the perpendicular is in power less quadruple to the line which coupleth the middle sections of the opposite sides. A pyramid, and an Octohedron inscribed in it, also an Icofahedron inscribed in the same Octohedron, doo containe one and the selfe same sphere.

Of the nature of an Octohedron.

Four perpendiculars of an Octohedron, drawne in 4. bāses thereof from two opposite angles of the said Octohedron, and coupled together by thre 4. bāses, describe a Rhombus, or diamond figure: one of whose diameters is in power dupe to the other diameter. For it hath the same proportion, that the diameter of the Octohedron, hath to the side of the Octohedron. An Octohedron & an Icofahedron inscribed in it, doo containe one and the selfe same sphere. The diameter of the solide of the Octohedron, is in power less quadruple to the diameter of the circle which containeth the bāse, and is in power triple to the right line which coupleth the centres of the opposite bāses: and is in power dupe superbi-partiens tercia to the perpendicular or side of the foresaid Rhombus: and moreover is in less triple to the line which coupleth the centres of the next bāses. The angle of the inclination of the bāses of the Octohedron, doth with the angle of the inclination of the bāses of the pyramid, make angles equal to two right angles.

Of the nature of a Cube.

The diameter of a cube, is in power less quadruple to the diameter of his bāse: and is in power triple to his side: and vnto the line which coupleth the centres of the next bāses, is in power less triple. Moreover the side of the cube is to the side of the Icofahedron inscribed in it, as the whole is to the greater segment: vnto the side of the Dodecahedron, it is as the whole is to the selfe segment: vnto the side of the Octohedron, it is in power dupe: and vnto the side of the pyramid, it is in power subdupe. Moreover the cube is triple to the pyramid: but to the cube the Dodecahedron is in a manner dupe. Wherefore the same Dodecahedron is in a manner sextuple to the sayd pyramid.

Of the nature of an Icofahedron.

Five triangles of an Icofahedron, do make a solide angle, the bāses of which triangles make a pentagon. If therefore from the opposite bāses of the Icofahedron

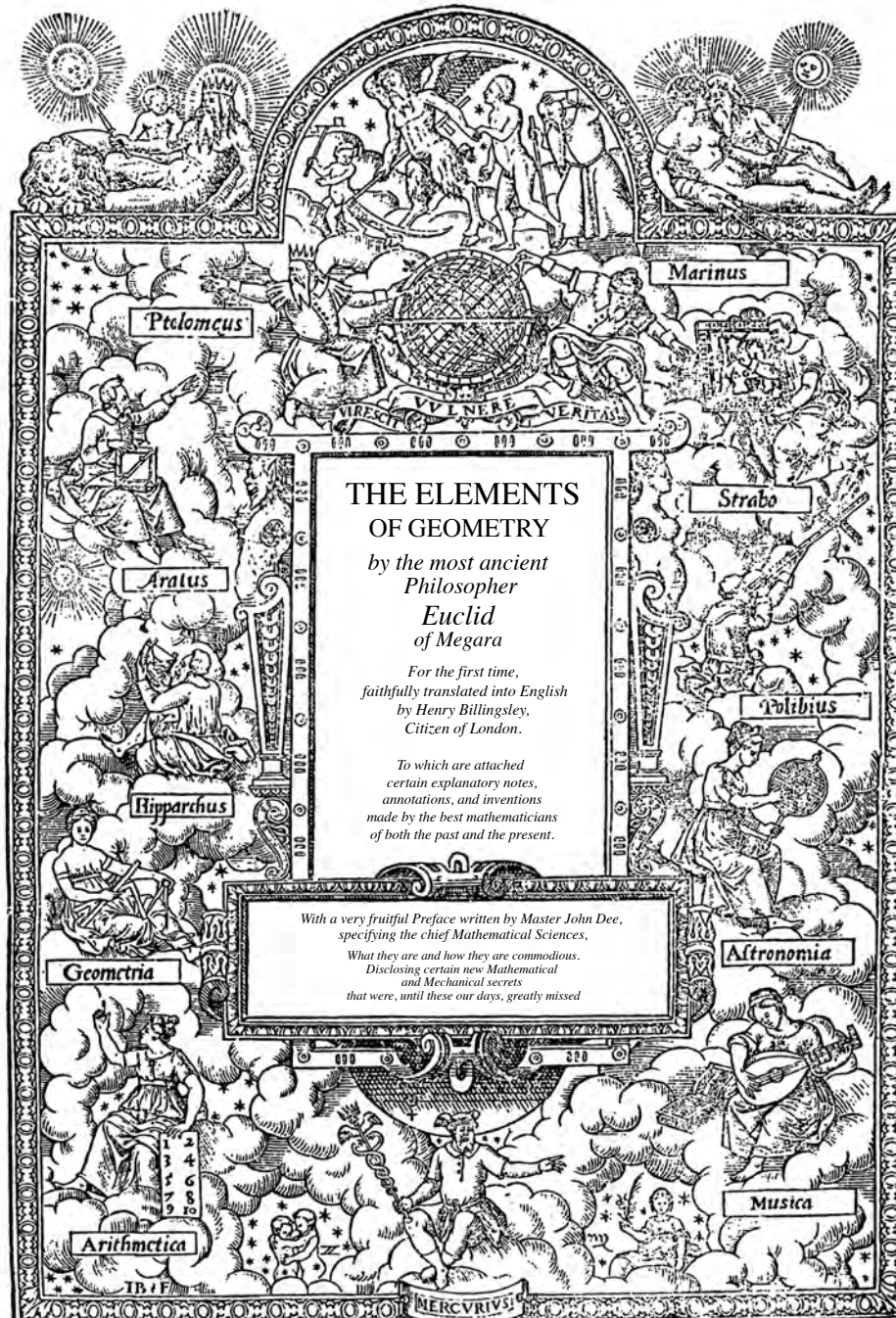
segment of the line which subtendeth the angle of the pentagon. A perpendicular line drawne from the centre of the dodecahedron to one of the bāses, is in power quintuple to half the line which is betwene the playnes: And therefore the whole line which coupleth the centres of the opposite bāses, is in power quintuple to the whole line which is betwene the sayd playnes. The line which subtendeth the angle of the bāse of the dodecahedron, together with the side of the bāse, are in power quintuple to the line which is drawne from the centre of the circle, which containeth the bāse, to the circumference. A section of a sphere containing three bāses of the dodecahedron taketh a third part of the diameter of the sayd sphere. The side of the dodecahedron, and the line which subtendeth the angle of the pentagon, are equal to the right line which coupleth the middle sections of the opposite sides of the dodecahedron. (27)

¶ The end of the Elementes of Geometrie, of the most ancient Philosopher Euclid of Megara.

EEE.









### *Notes on this Modernization*

On the facing page is a modernization of Dee's "Groundplat," which serves as a comprehensive index to all the things he discusses in the *Preface*. You'll see words you never knew existed. That's because Dee coined many of them (and they never really caught on).

Why bother translating an English book into English? One reason is simple. Few folks feel like wading through a swamp strewn with s's that look like f's. Second, for cost considerations, Elizabethan typesetters filled the pages chockablock with words. The text has been graphically lightened by adding much-needed breathing room.

For the sake of clarity, I have made other alterations. Chapter headings have been added that correspond with the Groundplat. Sentences have been shortened and rearranged. Words whose main definitions have morphed during the past centuries have been changed. Some spellings have been modernized (like Zography for Zographie). I have eliminated much of Dee's ubiquitous italicizing, but I have kept his emphatic capitalizations.

Some might feel that Dee's words should not be changed at all, much as Shakespeare's original words are often held sacrosanct. (To modernize or not to modernize, that is the question.)

To those traditionalists, and indeed to everyone, I recommend you plod through at least parts of Dee's Elizabethan English. I'll admit that certain subtle word meanings and alliterative phrases have been lost in my translation. But to me, it's better that this priceless antique is dusted off, polished up, and brought to light rather than let it remain in its original condition in a dark corner of the attic of history.

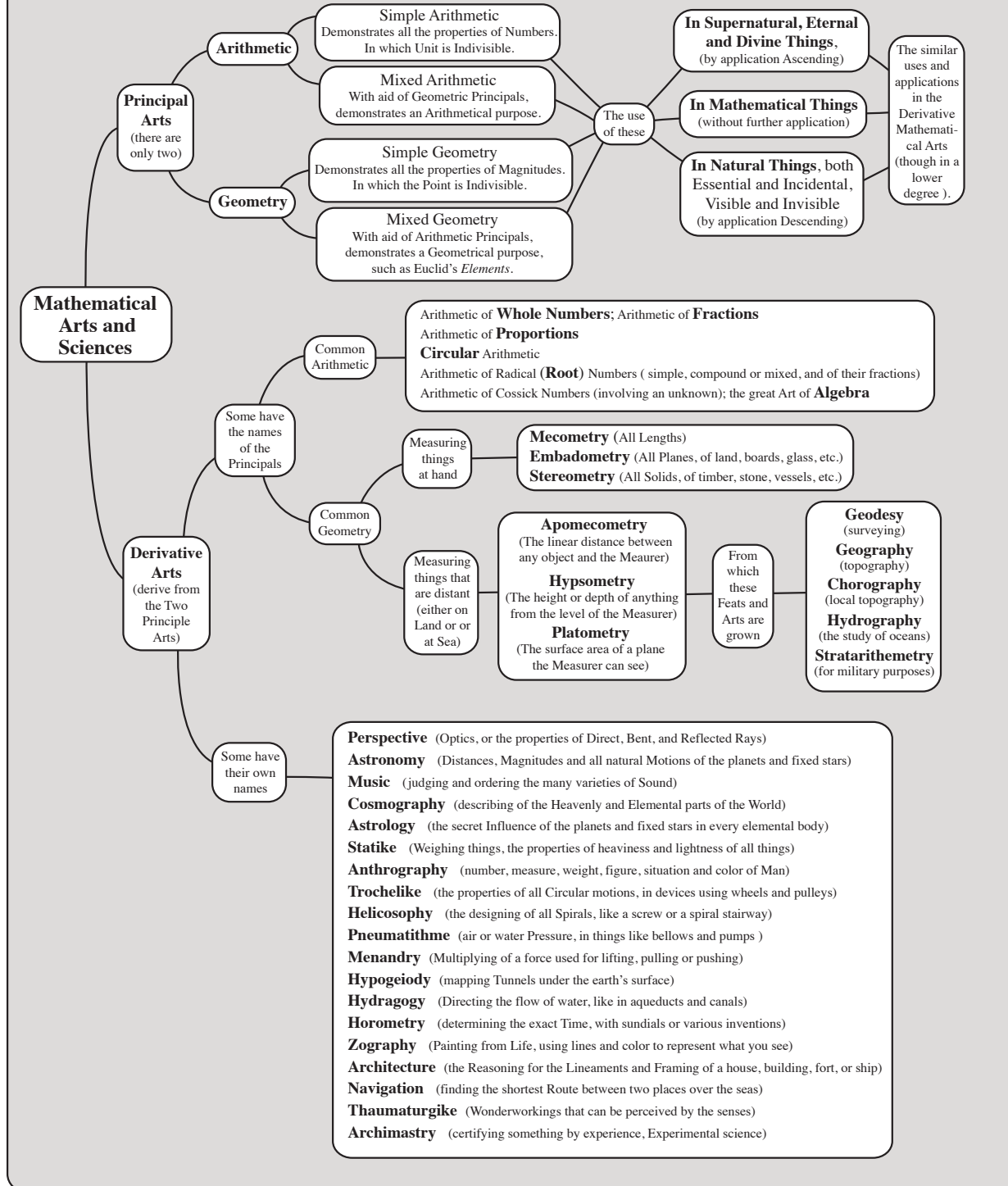
Dee's *Preface* provides an interesting overview of the main branches of science, but its real value is that it contains hidden clues that help unravel the puzzle of the *Monas Hieroglyphica*, as well as design of the John Dee Tower.

*Jim Egan*  
(2010)

J. DEE

Here you have (as promised) the **Groundplat** of my **Mathematical** Preface annexed to  
Euclid's *Elements of Geometry* published for the first time in our English tongue.

In the Year 1570, February 3.

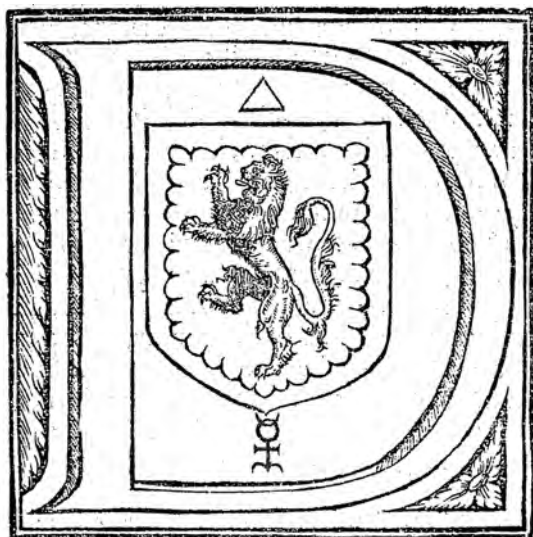






☞ TO THE GENUINE LOVERS  
of truth and diligent Students of the Noble Sciences,

JOHN DEE, of London,  
heartily wishes grace from heaven, and most prosperous  
success in all their honest attempts and exercises.



Ivine **Plato**, the great Master of many worthy Philosophers and the constant avoucher and pithy persuader of Unum, Bonum, and Ens [Truth, Goodness, and Beauty] in his School and Academy, was visited occasionally by certain kind of men (besides his ordinary scholars), allured by the noble fame of Plato, and the great commendation of his profound and profitable doctrine.

But such Hearers, after long harkening to him, perceived from the drift of his discourses that Unum, Bonem, and Ens was Spiritual, Infinite, Eternal, and Omnipotent. When they realized that nothing was being alleged or expressed about

worldly goods, worldly dignity, health, strength, lustiness of body, nor anything about the way to attain marvelous bodily bliss and happiness for the senses, immediately their fantasies were dampened. Their opinion of Plato was completely changed. Indeed, they came to look down scornfully on his doctrine and left his school, never to return.

Plato's student, **Aristotle**, felt the cause of this was that they had no forewarning or information about the general direction of his doctrine. Being aware of the scope of Plato's intentions beforehand, they could have better decided whether to stay away from the school or to study there to their full satisfaction. Thus, Aristotle learned to explain beforehand what he was going to speak about and the extent to which he would cover the subject. ”

As I think about the diverse styles of these two excellent Philosophers (though both certainly were a great teachers, and they often spoke without prefacing their teaching), I am in no little pang of perplexity. It would be easier for me to simply not write a *Preface* at all (using Plato as my example). Writing a *Preface* is more commendable and even essential (to introduce the Mathematical Arts into common use), but it is full of great difficulty and sundry dangers. Starting unceremoniously without an introduction would not be appropriate in presenting such unfamiliar matters to an audience so unacquainted with the subject. ”

I trust (now imitating Aristotle) that I can do justice to the full breadth and dignity of the Mathematical State by clearly prescribing its range, and precisely expressing its chief purposes and most wonderful applications.

I am certain that those diligent students, who listen to Plato all the way through his final conclusion, had their desires so infinitely fulfilled. Likewise, those who read my *Preface* introducing the Mathematical Arts will be greatly satisfied.

The quicker the Pythagorical, and Platonical perfect scholar and the determined, profound Philosopher is allured to this work, the sooner and faster he will (like the Bee) gather both wax and honey.

Thus, I consider it a great occasion (for the reasons just mentioned and also with respect to the general Mathematical Art), to use a certain forewarning and Preface, whose content shall be that mighty, most pleasant and fruitful **Mathematical Tree**, with its chief arms and second (grafted) branches. I will both explain and show the usefulness of these arms and branches. This enterprise is so great that (in these days) it has never accomplished by any one else (to my knowledge). Also, it is quite difficult, in these our dreary days, for such rare and strange Arts to gain the respect to which they are entitled.

*The intent of this Preface*

In exchange for my sincere endeavor to satisfy your honest expectations, all you have to do is lend me your thankful mind for a while. I will be as succinct as my speedy pen will allow. Apply your eye or ear attentively. Perhaps after reading the *Preface* you will find the lesson long enough. But more likely you will be hooked by the lion's claw and, being much more well-informed, make your own conjectures about its royal symmetries and other properties. Now, my gentle friends and countrymen, turn your eyes and bend your minds to that doctrine, which, for our present purpose, my simple talent is able to provide.

### ***[three kinds of things in the Universe: Supernatural, Natural, and Mathematical]***

There are three general categories of all things which have being: Supernatural, Natural, and a third kind. **Supernatural Things** are immaterial, simple, indivisible, incorruptible, and unchangeable. Supernatural Things can only be comprehended by the mind. **Natural** things are able to be perceived by the senses.

Natural things can involve probability and conjecture, but Supernatural things are the chief demonstration of a most absolute science. By comparing the properties of the two types, we can better describe the state, the condition, the nature and the property of the third thing I mentioned.

This third type is given a special name: **Mathematical things**. They are (in a manner of speaking) in the middle between Supernatural and Natural things. They are not as absolute and excellent as Supernatural things, but not as base and gross as Natural things. They are immaterial but, nevertheless, are they somewhat able to be signified by material things.

And though their particular Images are aggregable and divisible by art, their general **Forms** are always constant, unchangeable, untransformable, and incorruptible. They cannot, at any time, be perceived or judged by the senses, but they also can't be considered to have been first conceived in the royal minds of Man. Above the imperfection of conjecture, supposing, and opinion, yet just below high intellectual conceptualizing, are the Mercurial fruits of Dianetical discourse [the use of Reasoning], which exist in perfect imagination.

These Mathematical things have a marvelous neutrality, yet they also have a strange participation between Supernatural, immortal, intellectual, simple, indivisible things and Natural, mortal, sensible, compounded, divisible things.

Probability and sensible prose may well serve in natural things, and is commendable. However, in Mathematical reasonings a probable argument is not regarded as useful, nor can its testimony serve as proof. Only a perfect demonstration of certain essential and invincible truths (which have been universally concluded with certainty) will suffice for an exact and pure mathematical argument.

**[the two Principal kinds of Mathematical things:  
Number and Magnitude]**

There are two principal kinds of Mathematical things, namely, Number and Magnitude. We define **Number** to be a certain mathematical sum of Units.

A Unit is a mathematical thing that cannot be divided. Because of some likeness to this property of the Unit, something which acts like one, or is counted as one, may reasonably be called One.

We consider a **Unit** to be a Mathematical thing, though it be no Number, as it is indivisible. Actually, Number is a principal Mathematical thing because it consists of Units.

**Magnitude** is also a Mathematical thing. Anything whose nature involves length, width, or breadth is a Magnitude.

A Magnitude that has all three dimensions we call a Solid or a Body.

A magnitude with only two of these dimensions we call a Surface or a Plane.

A magnitude with only one of these dimensions we call a Line.

Every line has two ends. The ends of a line are called Points.

A **Point** is an indivisible Mathematical thing, which has a certain determined position. Moving a point from a determined position mathematically produces a Line in the direction it moved. In this respect, the ancient Mathematicians referred to a line as the race or course of a Point.

We also refer to a Point as Mathematical thing, even though it is not a Magnitude. It is indivisible because it is an end or boundary of a Line, which is a true Magnitude. We may define a Magnitude to be that Mathematical thing which is infinitely divisible into parts, whether it is a solid, a plane or a line. As I said, though a Point is not a Magnitude, Terminatively we regard it as a Mathematical thing because it is the end or bound of a line.

Neither Number nor Magnitude have any Materiality. First, we will consider Number and the Mathematical Science that pertains to it, which is called **Arithmetic**. Then we will consider Magnitude and its Science, which is called **Geometry**. (But I am not content with that word Geometry, for reasons I will discuss shortly).

How Immaterial and free from all matter Number is. Who does not perceive, or wonderfully wonder about this? For neither the pure Elements nor Aristotle's *Quinta Essentia* [Fifth Essence] can represent the proper matter of numbers. Nor is the purity and simplicity of spiritual and angelical substance proper enough to represent numbers.

As the great and godly Philosopher Anitius Boetius, said “ *Omnia quacuna a primeva rerum natura constructa sunt, Numerorum videntur ratione formata. Hoc enim fuit principale in animo Conditoris Exemplar.* ”

That is, “All things (which from the very first original being of things, have been framed and made) do appear to be formed by the reason of Numbers. For this was the principal example or pattern in the mind of the Creator.”

O comfortable allurements, O ravishing persuasions, to deal with a Science whose subject is so ancient, so pure, so excellent, so surmounting all creatures, and so used by the Almighty and incomprehensible wisdom of the Creator in the distinct creation of all creatures. The distinct parts, properties, natures, and virtues of all creatures are ordered and, by most absolute number, brought from Nothing to the Formality of their being and state.

We may both wind and draw ourselves into the inward and deep search and view of all Creatures' distinct virtues, natures, properties, and forms if we learn the properties of Numbers (as perfectly as the science permits.) And also, farther, arise, climb, ascend, and mount up (with Speculative wings) in spirit, to behold in the Mirror of Creation, the Form of Forms, the **Exemplar Number** of all things Numerable, both visible and invisible, mortal and immortal, Corporal and Spiritual.

Number

Note the word Unit to express the Greek Monas & not Unity as we have all-commonly, until now, used.

A point

A line

Magnitude

..



Part of this profound and divine Science was explored by **Joachim the Prophet** [Joachim of Fiore, ca. 1135-1202]. By using Formal, Natural and Rational Numbers he was able to predict and foretell particular important events long before they happened. His books are good proof of this. Besides that, the noble **Joannes Pico Earl of Mirandola**, [Pico della Mirandola, 1463-1493] was a trustworthy witness that “Joachim, in his prophesies proceeded by no other way than by Formal Numbers.”

In the  
Year 1488.

This Earl himself, in Rome, posted 900 Conclusions regarding all kinds of Sciences so they might be debated openly. Among the rest of his Mathematical Conclusions (in his eleventh Conclusion), he writes this sentence, in Latin (which I have phrased in English):

“By numbers, a way is had, to the searching out, and understanding of everything able to be known. To verify this Conclusion, I promise to answer to the 74 Questions written below by using Numbers.”

To avoid superfluous wordiness and because Pico’s works are commonly available, I will not relate these Conclusions, but they should be read diligently and contemplated thoughtfully by earnest Observers. The constant law of numbers is planted in Natural and Supernatural things, and is prescribed to all Creatures, to be kept inviolably. To stay within my bounds, I will simply mention that there are other remarkable things in Pico’s Conclusions which demonstrate wonderful mysteries that can be understood by way of numbers.

It is easy to gather that Number has a treble state: One, in the Creator. Another in every Creature (in respect of his complete constitution). And the third in Spiritual and Angelical minds, and in the Soul of man.

In the first and third state, Number is termed **Number Numbering**. But in the second state (all Creatures), Number is termed **Number Numbered**. Number bears such a sway and has such an affinity in our soul, that some of the old Philosophers taught that Man’s soul was a Number moving itself. And indeed, it does seem as though we are the result of a Fortunate Accident. However, the Fortunate Accident is that the Creator was a perfect and eternal being long before all Creatures were made.

Therefore, **Number Numbering** is the discretion, discernment, and distinction of things. In the beginning, God the Creator produced all things orderly and distinctly, according to his discretion. His Numbering was his Creating of all things. And his Continual Numbering of all things is why they are Conserved in being. Where and when he will lack a Unit, there and then, that particular thing shall be Dis-created. (But I won’t dwell on this subject)

Man’s dividing, distincting, and Numbering creates nothing. But with regards to the whole multitude of Number, it makes certain and distinct determinations. And even though these things be weighty, and truths of great importance (by the infinite goodness of the Almighty Ternarie), there are Artificial methods and easy ways by which the zealous Philosopher may approach this Riverish [abounding in rivers] Ida, this Mountain of Contemplation, and then even more Contemplation.

Number is a thing so Immaterial, so divine, and so eternal, but by degrees, little by little, stretching forth and applying some likeness of itself, it can become Material. It starts, as a Spiritual thing. Then it can be brought lower, to things perceived by the senses, like an echo. Then even lower, to things that may be seen and are numerable. And finally (most grossly) to a multitude of corporal things that can be seen and felt. Of these gross and sensible things, we are trained to learn a certain Image or likeness of numbers, and to use them skillfully for our pleasure and profit. As mortals, our spiritual selves are so coarse, and our understanding is so dull, that our Senses rule the commonwealth of our little world.



Thus we say, Three Lions are three, or a **Ternarie**. Three Eagles are three, or a **Ternarie**. Each of these Ternaries is the Union, knot and Uniformity of three discrete and distinct Units. That is, in each Ternarie, we can point out or show three separate parts: **One, One, and One**. But in Numbering, we say **One, Two, Three**. How far these visible Ones differ from our Indivisible Units (of pure Arithmetic) no man is ignorant.

From these gross and material things we may also be led back upwards, degree by degrees, directing our rude Imagination towards the conceiving of Numbers absolutely (now, not using created things to represent those imagined Numbers). Finally, at great length, we may be able to find the number of our own earthly name, gloriously exemplified and registered in the book of the most blessed and eternal Trinity.

### *[the various kinds of Common Arithmetic]*

Understand that vulgar Practicers have extended their definition of Numbers, in various ways, past what we call Numbers, whose smallest part is a Unit. The common Logician, Reckonmaster, or Arithmetician, in his using of Numbers, imagines parts smaller than a Unit and calls them Fractions. For example, he will divide a Unit in two, and call it “a half.” He can find an infinitely different number of ways to divide the Unit. Even further, he finds Fractions of Fractions.

**Addition, Subtraction, Multiplication, Division, and Extraction of Roots** are the chief parts of Arithmetic, the Science that demonstrates the properties of Numbers and all operations to be performed in numbers.

„Arithmetic.

„Note.

„

#### *[Arithmetic of Whole Numbers and Arithmetic of Fractions]*

1.

These five sorts of operations work differently with fractions than they do with whole numbers. Operations involving Fractions are so a distinctly different that we give them a specific name. The doctrine of working in whole numbers only, where a Unit is the smallest part allowed, is simply called **Arithmetic**. Using using smaller parts is called **Arithmetic of Fractions**.

#### *[Arithmetic of Proportion]*

2.

Similarly, the necessary, wonderful and Secret doctrine of proportionality also works in its own special way so we call it the **Arithmetic of Proportion**.

#### *[Circular Arithmetic]*

3.

For speed and greater ease of calculation, the Astronomers, (who deal with circular motions), have devised a special manner of ordering numbers, involving Sexagones [multiples of sixty], and Sexagesines [fractions of sixty]. The use of Signs, Degrees, Minutes and Seconds is called the **Arithmetic of Astronomical Fractions** or the **Arithmetic of Physical Fractions**. I have shortened the name to **Circular Arithmetic** because it is also used in circles that are not Astronomical.

#### *[Arithmetic of Radical (Root) Numbers]*

4.

Another special area of Numbers deals with which is **Incommensurability and Irrationality**, a characteristic that can be seen in the study of Magnitude. Remember, in pure Arithmetic, a Unit is the common Measure of all Numbers. But here, Numbers are like measurements found in Lines, Planes and Solids. Sometimes they are Rational, and sometimes Irrational. These are used in the 5 operations of Arithmetic mentioned above and have many types, like:  $\sqrt{\quad}$  *Square Root*,  $\sqrt[3]{\quad}$  *Cubic Root*, and *other roots*. So this is also considered to be a another different kind of *Arithmetic*.

[Dee actually uses  $\sqrt{\text{X}}$  for the square root symbol and  $\sqrt[3]{\text{X}}$  for the cube root symbol.]

In practice, often two, three, four, or more roots are combined, for example:

$$\sqrt{12} + \sqrt[3]{15} \quad \text{or} \quad \sqrt[4]{19} + \sqrt[3]{12} - \sqrt{2}$$

And sometimes whole numbers (or fractions of whole Numbers) are combined with various roots:

$$20 + \sqrt[3]{24} \quad \text{or} \quad \sqrt[3]{16} + 33 - \sqrt{10} \quad \text{or} \quad \sqrt[4]{44} + 12\frac{1}{4} + \sqrt[3]{9}$$

The variety of combinations is infinite. Some of these examples involve fractions, so this operation in Arithmetic greatly enlarged by various mixings with the other operations.

To steer clear of objections and to keep it understandable for students, I call this operation the **Art of Radical [Root] Numbers**. As you can learn in Euclid's Tenth Book, it is incorrect to think that all roots are Irrational Numbers (Surds). Calling them Radical Numbers and prefixing them with a special sign ( $\sqrt{\phantom{x}}$ ) distinguishes them from other Numbers.

### ***[Arithmetic of Cossick Numbers (involving an unknown); the great Art of Algebra]***

Aside from this, consider the incredible power of man's Search and Capacity, his infinite desire for knowledge. By mixing theory and practice he has gone ever further and discovered one of the most Practical uses for Number: the great Arithmetical **Art of Equation**, commonly called the **Rule of Cossick** or the **Rule of Algebra**. The Latins called it *Reglam Rei & Census* or the Rule of a Thing and its Value. This name is appropriate because it includes the first and last points of this work [both sides of the equation]. Some of its names in Italian, French, and Spanish include the Latin word *Res*, but usually it's simply called **Algebra**. However, there are two ways using this word can be misleading.

One has to do with the idea that Geber invented it [Abu Musa Jabir (Geber) ibn Hayyan, ca. 721- ca. 815]. The other has to do with the spelling of the word Algebra.

Geber had great skill in Numbers, Geometry, Astronomy, and other marvellous arts and was quite capable of developing this rule. However, long before Geber's time, a Greek Philosopher and Mathematician named Diophantus wrote 13 books on the subject (of which six are still extant). I was able to borrow them\* from the famous Mathematician and my great friend, Petrus Montaneus.

\*In the  
Year  
1550

And secondly, the true name is **Algiebar**, and not Algebra. This can be proven by the title of a work by the Arabian Avicenna, which was translated (with precision) into Latin by Andreas Alpagus (an expert in the Arabic language):

*"Scientia faciendi Algiebar & Almachabel i. Scientia inveniendi numerum ignotum, per additionem Numeri, & divisionem & aequationem."*

Which translated means, "The Science of working Algiebar and Almachabel, that is, the Science of finding an unknown number, by Adding of a Number, & Division & equation."

5. This title includes the name and it also touches on the the principal parts of the Rule. Calling it the **Rule of Equation** or the **Art of Equation** clarifies the State of the Rule and highlights its middle part [which is the equals sign, between the first part and the last part].

This Rule has a peculiar Character that makes it different from the other Arithmetical operations. It involves all the kinds of Numbers, Simple, Compound, Mixed, as well as Fractions. Because it contains the whole power of Numbers' practical Application, this Rule and the Arithmetic of Algiebar are profound subjects for Man's intellect to deal with. In human Studies, affairs, and exercises nothing involving number is more profitable or more suited to the divine force of the Soul.



### *[practical uses for Arithmetic]*

Perhaps you have been looking for proof or evidence of the use, profit, and Commodity of vulgar Arithmetic in the Common life and trade of men. I will now demonstrate how useful Arithmetic can be. I must be careful not to bore you with too many proofs, yet show you enough so that you understand the process. First, I will demonstrate a proof, then give four, five, or six examples. This should be enough to persuade any reasonable man to love, honor, learn, and practice the excellent science of Arithmetic.

Who is a better recipient of the fruits of Arithmetic than Merchants (of all kinds)? Some Merchants don't use Arithmetic, and feel they don't even need it. How could they possibly refuse the assistance of the **Golden Rule** (whether using it in a simple or compound instance) either **forward or backward**?

[In mathematics, the Golden Rule is the "Rule of Proportionality" or the "Rule of Three." When 3 numbers in a proportional equation are given, it teaches how to figure out what the fourth one is. For example, (2 to 3 = 9 to X) is "forward"; (2 to 3 = X to 12) is "backward"]

In the **Rules of Fellowship** (either with or without regard to time) how can they not be assisted by Arithmetic [Merchants in a company each profit in proportion to the percentage of stock they own]. Arithmetic is necessary even if it's just between a Merchant and his Factor [trading partner]. Wouldn't a Merchant find Arithmetic essential when Bartering wares, or when the exchange was partially goods and partially money?

How could Merchant Adventurers and Sea Travelers order their affairs properly (and without loss) unless certain **Rules for the Exchange** of money (or Rechange) were devised for their uses?

In many instances, the **Rule of Alligation** demonstrates truth. In how many instances has the Rule of Alligation been used to determine a truth so precise that it could not be determined by natural wits, regardless of experience? [Alligation means "a linking or mixing." If two differently priced grains are mixed, what is the price of the mixture? This rule is used in mixing medicines, or metals, or (shamefully) in the dilution of wine.]

And how ample and wonderful is the **Rule of False Positions**, especially as it has been explained by two excellent Mathematicians (who were acquaintances of mine in their lifetime). I am referring to Gemma Frisius and Simon Jacob. [This rule involves guessing an answer for an unknown in an equation, then making an adjustment upon seeing the result]

Who can briefly summarize the **Rules of Capital** without Arithmetic? [How much capital or money is needed to get a business or enterprise started.] Who can Imagine the Myriad of various cases and examples (in Act and earnest) that are determined by all these Rules?

I will leave it to the Merchants to explain all the other ways they commonly use Arithmetical Practices.

### *The Art of Graduation*

Mintmasters and Goldsmiths mix Metals of various kinds and values. They are properly directed and marvelously pleased Using Arithmetic as their guide. The honorable Physicians will acknowledge that they use the Science of Arithmetic in various ways. One of the main uses is to make compounds of Medicine using the **Art of Graduation**.

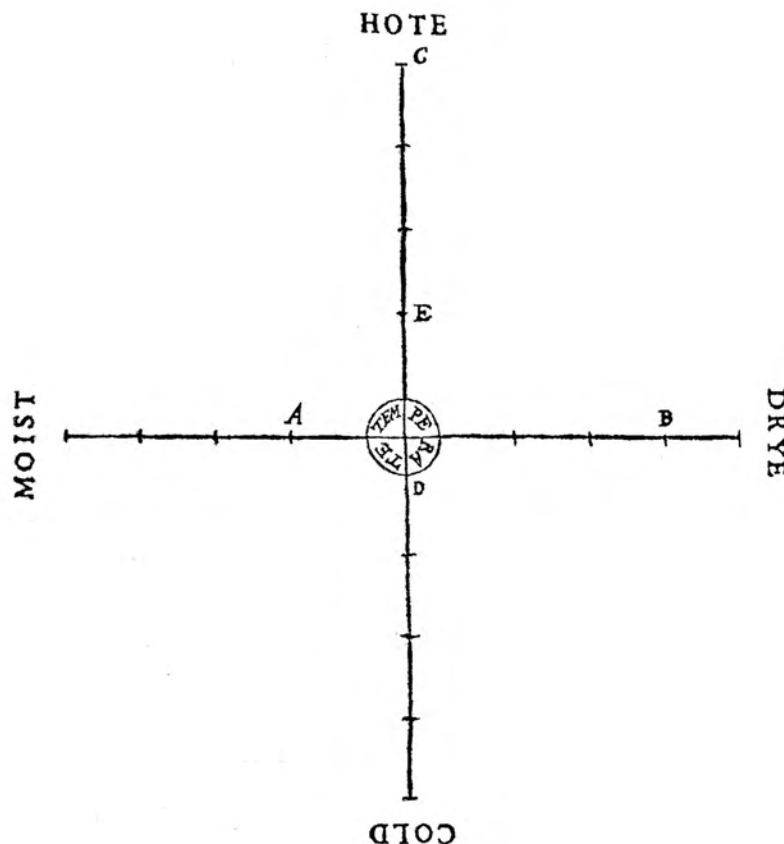
Galen, Aurerois, Arnold of Villanova, and Ramon Lull have each published Rules for determining the new Form Resulting from adding various Degrees above Temperament. But about 200 years ago, a Method was invented by a Countryman of ours that is easier, more precise, and more commodious. (I am uncertain who owns a copy of this little Latin treatise, or when it might be republished.)

R.B.  
[Roger  
Bacon]

Both to demonstrate my love of Country and to prove the usefulness of numbers (in this most subtle and fruitful philosophical conclusion), I will briefly explain the essentials.

First draw a circle with a diameter of one inch. Divide the Circumference into four equal parts. Extend four lines from the center outwards through the four points. Make each line  $4\frac{1}{2}$  inches long. (Thus they will be 4 inches long outside the circle.)

Indicate every inch with clear, accurate markings. If you wish, you can subdivide the inches again into 10 or 12 equal, smaller parts. At the ends of the lines write the 4 principal elemental Qualities Hot and Cold (opposing each other) and Moist and Dry (opposing each other.) In the Circle write the word Temperate. This word has a wide range of meanings. For example, it is used in determining the Complexion of Man [the 4 Humours or 4 Temperments in man are choleric, sanguine, melancholic, and phlegmatic.]



\*Take Raymond Lull's council in his book *de Quinta Essentia* [Fifth Essence]

Given two (mixable) things of known\* Degrees, their Quantities (or Weights) are either the same or different.

Regardless of whether the two things are equal or different, or if they are of the same or different Qualities [like Hot and Cold], the following rule applies: "The form resulting from their Mixture is in the Middle, between the degrees of the forms that are mixed."

For example, let A be Moist in the first degree and B be Dry in the third degree. Adding 1 and 3 makes 4. The half or Middle of 4 is 2. Thus, 2 is in the middle equally distant from A and B. Starting at B and counting 2 degrees towards A, the answer is Dry in the first degree. (\*Note that the Temperament is not counted. If, at any time, it's involved in the Mixture, simply use a Cipher [zero].)

Here's another example involving C and D on the chart. Suppose C is Hot in the fourth degree and D is even Temperament (or Zero). Adding 4 plus 0 makes 4. The middle, or half, of 4 is 2. Thus the Form Resulting from mixing C and D is Hot in the second degree.

Here's a third example. I have a liquid Medicine whose Quality of heat is exalted to the fourth degree (like C in the previous example). I have another liquid Medicine whose Quality (namely, E) is heat in the first degree. (Also let's suppose the quantities of each of these is the same.) Simply subtract the lesser from the greater and divide what remains into two equal parts.

So, subtracting 1 from 4 leaves 3. And half of 3 is  $1\frac{1}{2}$ . Add this to 1 and it results in  $2\frac{1}{2}$ . (Or you could have subtracted  $1\frac{1}{2}$  from 4 to also arrive at  $2\frac{1}{2}$ .)

If the Temperament Qualities of two things are different and their Quantities are also different, this Second Rule Applies. The proportion of the "lesser quantity" to the "greater quantity" is equal to the proportion of the "greater quantity minus the unknown result" to the "unknown result minus the lesser quantity."

This is easier to see by example. Suppose you had 2 pounds of liquid hot in the fourth degree and only 1 pound of Liquid hot in the third degree. To determine the Form Resulting from the Mixture of these two Liquids make a chart like this:

P. 2.	Hote. 4.
P. 1.	Hote. 3.

I have devised an easy, brief and general manner of solving this problem using Algiebar. Let's call the Middle form that we are searching for 1  $\mathcal{Z}$ .

[This is Dee's symbol for "the unknown." His putting a 1 in front of it does not affect it at all. In modern math, "the unknown" is usually the letter X. This tradition derives from Geber's Arabic word for "thing" which in Old Spanish was written XEI. However to avoid confusion with the multiplication sign "X," here I will use the letter Z, which somewhat resembles Dee's symbol.]

So applying the Second Rule, the proportion of the weights ("1" is to "2") is the same proportion that "the heavier (4) minus Z" is to "Z minus the lighter (3)."

In short, as 1 is to 2, so  $4-Z$  is to  $Z-3$ . In a proportion which involves 4 numbers, the first times the fourth always equals the second times the third.

Doing that multiplication results in  $(2-3) = (8-2Z)$ .

Using the Art of Algebra we add 3 to each side of the Equation, resulting in  $Z = 11-2Z$ .

To reduce it further, we can add  $2Z$  to each side. This results is  $3Z=11$ .

Dividing 11 by 3, the Quotient is  $3\frac{2}{3}$ . This is the value of the 1, the Coss or the Thing that we were looking for. So the Form Resulting is Heat in  $3\frac{2}{3}$  degrees.

P. 2.	Hote. 4.	$\frac{1}{3}$ $\frac{2}{3}$	$3\frac{2}{3}$ The forme resulting.
P. 1.	Hote. 3.		

To check or prove this is easy. Subtracting 3 from  $3\frac{2}{3}$  leaves  $\frac{2}{3}$ . Subtracting  $3\frac{2}{3}$  from 4 leaves  $\frac{1}{3}$ . And the proportion of  $\frac{2}{3}$  to  $\frac{1}{3}$  equals the proportion 2 to 1, which is what was originally given. (Alternatively we could have added  $2Z$  to each side, prior to subtracting 3 from each side. This reduces to  $3Z-3=8$  which is  $3Z=11$ , and the answer is the same.)

Note.

“

“

“

“

“ The

“ Second

“ Rule

“

“



Though this example only involves Mixing two things, more commonly three, four, five, six or more things are combined into one Compound. Apply these same rules to determine the Form Resulting from the mixture. The easiest procedure is to determine the Form Resulting from the first two things, then combine that result with the third thing. Continue this way and the final result is the Form Resulting from the mixture of them all.

I don't need to speak much about what the Mixture is. Common Philosophy defines it this way: *Mixtio est miscibilium, alteratorum, per minima conjunctorum, Unio*. ['Combination' is the unification of the 'combinables' resulting from their 'alteration.' From Debus, *Alchemy and Early Modern Chemistry*, p. 175]

Every word in this definition is of great importance.

I also don't need to spend time showing how the other manner of distributing degrees also agrees with these Rules. Neither do I need to mention further uses of the **Cross of Graduation**.

Nor will I give any more examples of the kinds of ways the two aforementioned general Rules can be used. There is enough information here for the quick witted and the Studious. Some may not understand what I mean without a more lively teaching, but this is not the proper place to discuss it in full. It is possible that others, with a proud sniff, might disdain what little I have discussed here and would be ungrateful even if I did elaborate.

To conclude, those with modest and earnest Philosophical minds will praise God highly for this. They will Marvel that the profoundest and subtlest point about the Mixture of forms and Natural qualities: It is matched and married so wonderfully with the simple, easy, and short way of the noble Rule of Algiebar.

Who cannot love, praise, and honor the excellent Science of Arithmetic? For here you can see that the little finger of Arithmetic is mightier and more ingenious than the intellect of 100,000 average men.

### *[even more practical uses for Arithmetic]*

*Taxtixou* “  
[Tactics] “

Next, we will discuss how the wise and valiant Captain can authoritatively be helped by the Rules of Arithmetic in what the Greeks called *Taxtixou* [Tactics] or the **Skill of Arranging Soldiers for Battle**.

In his work dedicated to Emperor Hadrian, Aelianus writes about the importance of Numbers and Mathematics in Tactics. He felt that his book was more comprehensive than all previous books written on this Art.

Many worthy Captains, Philosophers and Princes of Immortal fame and memory have praised Aelianus' work, including Aeneas, Cyneas of Thessaly, Pyrrhus Epirota (and his son Alexander), Clearchus, Pausanias, Euangelus, Polybius (a close friend of Scipio), Eupolemus, Iphicrates, and Passidinius. His work discusses the use of Geometrical figures, but the fairest flower in their garland of Tactics, that which helps the Captain the most, is Arithmetic and an understanding of Geometric figures.

There are many ways Arithmetic stands the Captain in great stead. For example, one way is in determining how provisions should be distributed, whether the Army is of a constant size or if the number of soldiers were to suddenly increase. The good Art of Arithmetic might also be used if the number of soldiers were to suddenly decrease, in order to apportion provisions so they will last for a longer time.

The wise, expert, and thoughtful Captain will agree that for other Reckonings, Measurings, and Apportionings, the Science of Arithmetic is one of his chief counselors, directors, and assistants. This was made evident by the Noble, Courageous, loyal and Courteous **John, the late Earl of Warwick**. Though few knew this young Gentleman personally, his character traits (his lusty bravery, force, and skill in Chivalrous feats, his humbleness, and friendliness to all men) were seen openly by the whole world.

What virtue he had fastened to his breast. What Rules of godly and honorable life he had framed to himself. What notable vices he took great care to eschew. What manly virtues in other noblemen (flourishing before his eyes) he aspired after. What prowess he tried and was determined to achieve. What feats and Arts he began to furnish and fraught himself [acquired] in order to serve his King and Country, both in peace and war.

No one can attest to his Heroical Meditations, forecastings, and determinations better than I. With firm Conscience and to the honor of virtue, I recommend his name be put in the Register of Immortal Fame.

By one act in particular (there were many more that I noted, both in England and France) this John revealed his hearty love of the virtuous Sciences and his noble intent to excel in martial prowess.

He requested of me the best Rules for the ordering of all Companies, sums, and numbers of men (either from Greek or Roman times or from new Strategies devised in our times). It was taken into account whether a soldier had one weapon (or more), whether they had Artillery (or not), and whether they were on horseback or on foot. It was considered whether he was trying to make a few men seem like a large force, or if many men were to appear as only a few. Or if the soldiers should march as a large group into the Battlefield, or engage in several minor skirmishes, or even to arrange an Ambush. He wrote the pertinent Arithmetical Rules on a vellum parchment which he kept in a Gold Case worn around his neck. It was his most precious Jewell, his most trusted Counselor. Thus, he enshrined Arithmetic in gold. Of Number's results he had good hope.

This noble Earl died in the Year 1554 scarcely 24 yaers old having no children with his wife, the Daughter of the Duke of Somerset

I hardly need to provide testimony as to how needful, fruitful, and skillful Arithmetic is for Schoolmasters of Justice. By this I mean all types of Lawyers. Even Civilians can attest to the idea that the Art of Numbers is needed to perceive ancient Roman Laws or how an infinite number of cases of Justice are able to be settled. Papinianus instituted a just law of partition and allowance between a man and his wife after a divorce by using the great Art of Arithmetic. Accursius, Baldus, Bartolus, Jason, Alexander and finally Alciatus used Arithmetic to detect, convince, and make the truth shine clearly instead of jumbling, guessing and erring about the equity and Intent of the lawmaker. Good Bartolus, using Accursius' thorough Glosse, wrote about apportionings:

*"Nulla est in toto libro: hac glossa difficilior: Cuius computationem nec Scholastici nec Doctores intelligunt ..."*

That is, "In the whole book, there is no Gloss harder than this, Whose account or reckoning, neither the Scholars, nor the Doctors understand ..."

What can they say of Julian's law (*Si ita Scriptum ...etc.*) regarding the just distribution of a deceased man's estate among the wife, Son, and daughter? How can they perceive the Arithmetical Reckoning of Africanus where he discusses **Lex Falcidia**. How can they defend him from his Reprovers or even understand his supporters like Johannes, Accursius Hypolitus and Alciatus? How can they even perceive how skillfully Africanus' reckoning was made?

He proportioned the Sums bequeathed to the legitimate heirs in this way: Upon death, the heirs received  $17 \frac{1}{7}$  [percent] of the estate. After 10 months another  $12 \frac{6}{7}$  [percent] of the estate was distributed. This makes a total of 30 [percent]. The proportion of  $17 \frac{1}{7}$  to  $12 \frac{6}{7}$  is the same proportion that 100 has to 75, that is, the **Sesquiertia**, or 4 to 3, which makes 7.

In many areas of Civil Law, an expert Arithmetician is required in order to understand the deep Judgement and Just determination of the Ancient Roman Lawmakers. One must be even more of an expert to equitably decide the wide the variety of Cases in Civil Law. Thus, you can conjecture that in Canon Law and in the laws of the Realm (which bear chief authority with us), Justice and equity would be executed more skillfully with knowledge of Arithmetic and Proportions.

Many worthy Philosophers and prudent lawmakers, who have written many books *De Republica* [Concerning the Republic] (on the ways to procure and maintain the best state of Commonwealths) have already determined the Rules of Justice.

Justice. “ Justice is not only the Base and foundation of Commonwealths, but also the total perfection of all our works, words and thoughts. It is a virtue that pertains to everyone. God challenges this at our hands. To be honored as God. To be loved as a father. To be feared as a Lord and master. Our neighbor’s proportion is also prescribed by the Almighty lawmaker. That is, do unto others as we wish others would do unto us. These proportions are necessary in Justice, commendable in duty, and are essential to the life, strength, maintenance and flourishing of Commonwealths.

Aristotle in his book *Ethics* (to fetch the seed of Justice and use it as a beacon) was reluctant to use the perfection and power of Arithmetical and Geometrical proportions of Number.

Plato’s purpose in his book called *Epinomis* (the Treasury of all his doctrine) is to seek a Science, which, when a man had it perfectly, he might seem (and indeed so be) Wise.

Briefly discussing other Sciences, he finds them inadequate. But of the Science of Numbers, he says, “*Illa, qua numerum mortalium generi dedit, id profecto efficient.. Deum autem aliquem, magis quam fortunam, ad salutem nostrum, hoc munus nobis arbitror contulisse ... Nam ipsum bonorum omnium Authorem, cur non maximi boni Prudentia dico, causam arbitramur.*”

This translates as: “That Science, verily, which has taught mankind numbers, shall be able to bring it to pass.” And, I think, a certain God (rather than fortune) gave us this gift for our bliss.

☞ For why should we not Judge he who is the Author of all good things to also be the cause of the greatest good thing, namely Wisdom? Then, at length, he proves that Wisdom can be attained by good Skill of Numbers. With which great Testimony and the manifold proof and reasons, (expressed earlier), you may be sufficiently and fully persuaded (by the perfect Science of Arithmetic) to agree with Plato.

**Of all Sciences besides Theology, Arithmetic is most divine, most pure, most ample, most profound, most subtle, most commodious and most necessary.** Its close Sister is the Absolute Science of **Magnitudes**, of which I now intend to write (by the Direction and Aid of him, whose Magnitude is Infinite, and to us, Incomprehensible).

Both with the Multitude and also with the Magnitude of Marvelous and fruitful truths, you (my friends and Countrymen) may be stirred up, and awakened, to behold what certain Arts and Sciences (to our unspeakable behalf) our heavenly father, has prepared for us and which have been revealed to us by various Philosophers and Mathematicians.



***[Geometry (Megethologia) or Science of Magnitudes]***

Of Number, a Unit, and of Magnitude, a Point, do seem to be much like original causes. Nevertheless, there is a great difference between the two. We defined a Unit, to be an indivisible Mathematical thing. A Point, likewise, we said to be an indivisible Mathematical thing.

Furthermore, a Point may have a certain determined Situation. We may assign or prescribe a Point to be here, there, yonder, etc. However our Unit is free and can abide no bondage, nor be tied to any place or seat, (whether divisible or indivisible).

**A Point may have a Situation limited to him, a certain motion, to a place, and from a place. But, a Unit cannot be thought of as having any motion.**

A Point, by its motion, Mathematically produces a line (as we said before) which is the first and most simple kind of Magnitude. But, a unit cannot produce a number. Even though it is produced by a Point being moved, a line does not consist of points.

Contrarily, even though it is not made by a unit, Number consists of units, as a material cause. Numbers  
**Formally, Number is the Union or Unity of Units.**

This uniting or knitting is the workmanship of our mind. From these distinct and discrete units our mind makes a Number, which by uniformity, results in the formation of a certain multitude of units. Thus, every number has the Unit as its least part.


But Magnitudes (like a line) do not have a least part as they are infinitely divisible. All Magnitude is either a Line, a Plane, or a Solid. A Line, Plane, or Solid can not be perceived by any sense, nor can they be exactly represented in any way, nor produced by Nature, the way Number (by degrees) is able to be perceived.

However, we can use visible forms to imagine what our Mathematical Line is or what our Point is. So precise are our Magnitudes, that one Line is no broader than another, for they have no breadth. Nor do our Planes have any thickness. Nor do our Bodies have any weight regardless of how large their dimensions are.

Our Bodies are both Smaller than either Art or Nature can produce yet also Greater than all the world can comprehend. Our least Magnitudes can be divided into as many parts as the greatest. An inch-long Line may be divided into as many parts as may the diameter of the whole world (whether that diameter is extended from East to West or in any other direction.)

What privileges our two Mathematical Sciences exhibit over all manual Art and Nature. They deal with things of such power, liberty, simplicity, purity, and perfection. They proceed so certainly, so orderly, so precisely. The Mechanical Workman who can best represent Mathematical works is judged as the most excellent.

Our two Sciences are pure in their own ways and in their own Matters. They each can be Demonstrated in ways that are plain, certain, universal and eternally true.

All Philosophers, from the beginning to now, have called the Science of Magnitude (its properties conditions and appurtenances) by the name **Geometry**. But truthfully, this term is too base and scant for  Geometry  
 a Science of such dignity and fullness.

Possibly that name has been used by all wise men throughout history so that it might carry in perpetual memory the first and most notable benefit which this science showed to common people. In other words, how Common land might be divided into parts using boundaries. Sometimes boundary lines got lost or confused, as in Egypt when the Nile River (the greatest and longest river in the world) overflowed every year. Sometimes land was bequeathed, assigned, or sold and needed to be properly divided.

Through ignorance, negligence, fraud, or violence often one man might wrongfully limit, measure, encroach or challenge the lands of another, causing great loss, disquiet, murder, or even war. Finally, by God's mercy and by man's Industry, the perfect Science of Lines, Planes, and Solids (like a divine Judge) allowed every man to have his own. Pleased by this art, and greatly relieved by the just measuring, the Philosophers who wrote the rules for land measuring named it Geometria, that is, (according to the very etymology of the word) "Land Measuring". The people knew no further use for Magnitude other than in Planes.

And the early Philosophers and Scholars did not disclose to these people anything other than flat, plane Geometry. But Philosophers like Plato and Pythagoras, (even though they understand the etymology of the word *Geometria*) all used the term. Plato defines it as, "*Studium quod circa planum versantur*" [The study of flat planes]

Plato, in Book  
7 of Republic

Euclid, in the *Elements of Geometry*, never mentions Land Measurement, but clearly demonstrates how Geometry is useful for more than measuring Plane surfaces. Thus, we need a better name for our Mathematical Science of Magnitudes, which regards neither clod nor turf, neither hill nor dale, neither earth nor heaven. It is absolute Megethologia, not walking the ground and dazzling the eye with pole, perch, rod, or line, but lifting the heart above the heavens by invisible lines and immortal beams, meeting with the reflections of incomprehensible light, and so procuring unspeakable Joy and perfection of what I prefer to call **Megethica** or **Megethologia**.

Divine Plato exercised good taste and judgement regarding the name Geometry by warning his Scholars about the name Geometry in the seventh Dialogue of the Commonwealth [in *Republic*, Book 7].

Here is a good translation from Plato's Greek into Latin: "*Profecto, nobis hoc non negabunt, Quincuna vel paululum quid Geometria gustarunt quin hac Scientia, contra omnino se habeat, quam de ea loquuntur, qui in ipsa versantur.*"

In English, this reads: "Verily (says Plato), whosoever has tasted even the least amount of Geometry, will not deny this Science is of another condition quite contrary to that which they who are exercised in it speak of it."

And there it follows, regarding our Geometry,

"*Quod quaeritur cognoscendi illius gratia, quod semper est, non & eius quod oritur quando & interit. Geometria, eius quod est semper, Cognitio est. Attollet igitur (o Generose vir) ad Veritatem, animum atque ita, ad Philosophandum preparabit cogitationem, ut ad supera convertamus, qua, nunc, contra quam decet, ad inferiora deycimus, &c. Quam maxime igitur praecipendum est, ut qui preclarissimam hanc habitat Civitatem, nullo modo, Geometriam spernant. Nam & quae praeteripsius propositum, quodam modo esse videntur, haud exigua sunt &c.*"

"That [Geometry] is learned, for the knowing of that which is forever, and not of that which, in time, is brought to an end. Geometry is the knowledge of that which is everlasting. It will lift up therefore (O Gentle Sir) our mind to the Truth, and by that means, it will prepare the Thought to the Philosophical love of wisdom, that we may turn or convert toward heavenly things (both mind and thought) which now, when it comes to us, we cast down on base or inferior things. ... Chiefly, therefore, it should be commanded, that those who inhabit this most honorable City, must in no way look down upon or disregard Geometry. There are many important things that seem to be outside the realm of Geometry, but they are not ..."

And besides the many uses of Geometry in matters pertaining to war, he adds that there is a second unpurposed result and commodity arising from Geometry saying:

*“Scimus quin etiam, ad Disciplinas omnes facilius per descendas, interesse omnino, attigerit ne Geometriam aliquis, an non &c. Hanc ergo Doctrinam, secondo loco descendam Juvenibus statuamus.”*

“But, also, we know, to learn all Arts more easily, it is very important that one have knowledge of Geometry. Let us therefore make an ordinance or decree that this Science shall be learned by all young men in the second place.” [that is, following Arithmetic]

This was the Judgment of Divine Plato, both of the purposed, chief, and perfect use of Geometry and of its secondary, dependant, and derivative commodities. For us Christian men, a thousand thousand more occasions exist that require the assistance of Megethological Contemplations, which will train our Imaginations and Minds, little by little, to forsake and abandon the gross and corruptible objects of our outward senses, so we can apprehend Mathematical Things by sure demonstrative doctrine.

And by these **\*Megethological Contemplations** readily we will be helped and conducted to conceive, discuss, and draw conclusions about Intellectual, Spiritual, and Eternal affairs. These things are related to our everlasting Bliss, which otherwise (without Special privilege of Illumination or Revelation from heaven), no mortal man’s intellect (naturally) is able to reach or encompass.

J.D.  
\*Herein I  
would gladly  
shake off that  
Earthly name  
Geometry

And, verily, by my small Talent (from above), I am able to prove and testify that the literal text and order of our divine Law, Oracles, and Mysteries requires more skill in Numbers and Magnitudes than the expositors have usually uttered. They have only, at most, shown their own lack of knowledge. (To name any is needless, and this is not the occasion to note the places. But if I am duly asked, my answer is ready.)

And without the Literal, Grammatical, Mathematical or Natural truths of such places (perceived by good and certain Art), the Spiritual sense of those places (by Absolute Theology) cannot be comprehended. Therefore, no man can doubt that toward the attaining of incomparable knowledge and Heavenly Wisdom, Mathematical Speculations (both Numbers and Magnitudes) are means, aids, and guides – ready, certain, and necessary.

„ 

„  
„  
„  
„

Henceforth, in this my Preface, I will frame my talk to the fugitive Scholars of Plato, or rather, to those who can (and also will) use their outward senses for the glory of God, for the benefit of their Country, and for their own secret contentment or honest preferment on this earthly Scaffold.

To them, in an orderly manner, I will recite. describe and declare a great Number of Arts derived from our two Mathematical fountains and seen in the fields of Nature. Because of these fountains, the Seeds and Roots that lie deeply hidden in the ground of Nature are refreshed, quickened, and provoked to grow, shoot up, flower, and bear infinite and incredible fruit.

These Arts depend more upon Magnitude’s properties more than upon Number’s properties. And there is good reason why we call them Arts or more specifically, the Derivative Mathematical Arts.

I define an **Art** to be a “complete Methodical Doctrine that deals with enough particular matter to give the Metaphysical Philosopher knowledge necessary to the human state.” I define a **Derivative Mathematical Art** as that which orders and confirms its doctrine as perfectly as the subject matter will allow (by a Mathematically demonstrative Method in Numbers or Magnitudes).

An Art.

A Derivative  
Mathematical  
Art



A *Mechanician*.

I intend to use the name Mechanician differently than it has been used previously. Its's only appropriate (for distinction sake) that I give you also a brief description of what I mean by this. A **Mechanician**, or a **Mechanical workman**, is he who is skilled to work and finish any sensible work without knowledge of Mathematical demonstration which a principal or derivative Mathematician has demonstrated or can demonstrate.

I know full well that he who invents or makes these demonstrations is generally called A Speculative Mechanician or a Mechanical Mathematician. So in many instances, one man may have several different names, depending on the various arts in which he is skilled.

For example, a Logician, sometimes (in dealing with the same matter in different ways) may also be a Rhetorician. I make mention of these trifles, (as now, in respect of my Preface) for the sake of subtle curious disputers. In other places, they may ask me to support my reasoning, but here I will not dwell on it.

### 1. *[measuring things at hand using Common Geometry]*

Common  
Geometry.

From the purity, absoluteness, and Immateriality of Principal Geometry, another kind of Geometry is derived. What the vulgar call Geometry is the Art of Measuring the qualities and contents of sensible magnitudes.

1. I call this **Mecometry** [Mechanical Geometry]. It teaches how to measure things at hand, or things to be measured in the field. It teaches how to measure linear distance or circumference of Length, Plane, or Solid using a Compass, Rule, Square, Ell, Perch, Pole, Line, Gaging rod (or similar instrument).  
Measuring the area of any plane Surface, whether it be Surveyed ground, measured Board, Glass, or something similar is named **Embadometrie**.
2. Measuring the Solidity or contents of any bodily thing like Timber, Stone, the content of Pits, Ponds, Wells, Vessels, small & great, of all shapes for Wine, Oil, Beer, or Ale is commonly called **Gaging**. And the general name of these Solid measures is called
3. **Stereometry**.

### 2. *[measuring things at a distance using Common Geometry]*

Also, this vulgar Geometry can teach the practiser how to measure things even if there is a good distance between him and the thing measured. This measuring of how far an observable thing (on land or water) is from the measurer is called **Apomecometrie** [Apo means out of + mechanical geometry]. Measuring the depth below or height above the level where the measurer is, whether seen on land or in water, is called **Hypsometrie**.

3. Measuring the width of anything in the measurers' view, whether situated on Land or Water is called **Platometrie** [Plat means flat]. Though here I'm discussing not only things measured on Land and Water, but also the height of clouds or the height and volume of blazing Stars and the Moon. I will touch more upon these kinds of measurement when discussing the Arts of Perspective and Astronomy.

Note.

**[Feats or Arts of Commom Geometry]**

**[Geodesy]** [surveying]

From these Feats springs the Feat of Geodesy or Land Measuring, a way to cunningly measure and Survey far-off Land, Woods, and Waters. I say more cunningly, but God knows in these realms of England and Ireland great wrong and injury has (in my Time) been committed by untrue measuring and surveying of Land or Woods (whether through ignorance or fraud).

*Note.*

But of this I am certain, the difference between truthful and untruthful surveys might be determined by hiring an excellent Mathematical Reader from each of our two Universities for a mere 100 marks a year.

The French King employs two such Mathematical Readers from the famous University of Paris at the cost of 200 French Crowns. But let's return to our purpose and see how the skills of Geography, Chorography, Hydrography and Strarithmetry have grown from this knowledge of Geometry.

**[Geography]** [topography of large areas]

Geography teaches the various ways (spherical, in plane, or other) to describe and design and represent (in commensurations analogous to Nature) the situations of Cities, Towns, Villages, Forts, Castles, Mountains, Woods, Havens, Rivers, Creeks and other such things upon the surface of the earthly Globe (either all of it or a principal part of it).

Daily and hourly, many men realize the great pleasure and many benefits of this Art. Some collect artifacts from battles fought, earthquakes, heavenly firings and similar occurrences mentioned in history books to beautify their Halls, Parlors, Chambers, Galleries, Studies or Libraries. They help us understand the geography of adjoining lands and lands quite distant from us.

Such maps might have come from that little morsel of ground in the heart of Christendom [Jerusalem], or from the large dominion of the Turks [Asia Minor], or from the wide Empire of the Muscovite [Moscow, or Russia] not to mention the rest of the world. Some use the maps to guide them on their journeys to far lands, and others use them to understand the travails of other men. To properly explain the various reasons men like, love, obtain, and use Maps, Charts and Geographical Globes would require a whole book.

**[Chorography]** [local topography]

Chorography seems like an underling or branch of Geography, but it has many practical uses. Some call it Topography. [In Greek *Xora* and *Topo* both mean place.]

It teaches how to analogically describe the contents of a small circuit of ground while disregarding the surrounding parcels. In the territory or parcel of ground it describes, it leaves out no notable or odd thing that is visible above ground. Sometimes it even gives a peculiar mark or warning about underground things, like Metal mines, Coal pits, Stone quarries or the like.

Thus, a Dukedom, a Shire, a Lordship (or even less) can be accurately depicted. It is marvelously pleasant and profitable to view the plot of a City, Town, Fort, or Palace in true Symmetry without having to actually be there. Out of Gunshot, an Architect can study the topography of Hills, Rivers, Havens and Woods.

**[Hydrography]** [oceans]

Hydrography provides us with a perfect analogical description of the Ocean seacoasts in the principal parts of the world on either a flat plane or a round Globe. It depicts not just the Seacoasts but also the Islands and places of danger like Quicksands, Banks, Pits, Rocks, Countertides and Whirlpools.

As Geography deals principally with the Earth's description, Hydrography deals chiefly with Water. But it also incorporates certain dangerous Landmarks visible from the sea, with regards to their compass direction, location, shape, and size.

And along all the coasts, a Hydrographer should record what Moon makes a full Sea and how the Tides and Ebbs come and go. The Hydrographer should know by soundings about the depths and ways of Channels (at high and low tide) through observation and diligent Measuring.

There are many other aspects of Hydrography (or how to make a Rudder) that I could write about, like the 32 points of a Compass or how to describe the location of a place on the Globe. (Only four people in all of England know that a Sphere in plane has neither straight lines nor circles.)

I could write about matters like the Variation of the Compass from true North (of great importance to all), but I will stop as I've already enlarged the bounds and dutys of a Hydrographer more than any man to this day. However I am quite able to prove that all these things pertain to the Hydrographer. Ultimately the chief purpose of this Art is in the Art of Navigation, but it has other uses and can be enjoyed by those that never go to sea.

**[Stratarithmetry]** [battle arrays]

Stratarithmetry is the skill (pertaining to war) by which a man can depict using Geometrical figures a certain grouping of Soldiers. (This is because there is a regularity in the space between soldiers. You can't take a fraction of a man, but any overplus of men can be added to the next troop.) Thus, any army or company of men (standing orderly, in a shape known dimension) can easily be counted\*.

\* Note.

The difference between Stratarithmike and Tacticie “ This is a sufficient description of Stratarithmetry for now. It differs from *Tacticall De aciebus istruendis* [“Tactics, the planning of a battle array”] because it involves the wisdom, foresight and skillful ability to arrange and purpose a company of men.

“ By figure, I mean either a Perfect Square, Triangle, Circle, Oval, long Square (the Greeks called this *Eteromekes*), Rhombus, Rhomboid, Lunular, Ring, Serpentine and Other Geometrical figures used in past and future wars for commodiousness, necessity and advantage. Stratarithmetry is also useful in making a true report or estimate of the number of Enemy foot soldiers and horsemen who might still be far off.

Even to provide a “not more than” or “not less than” figure is not an easy thing, even for those so bold enough to take on that challenge. In various instances, a Captain can use Geometrical Figures in taking advantage of the three kinds of usual spaces between footmen and horsemen. If he has many men, they can be arranged to make the greatest show. If he has few men, he can use Figure and space to make it seem as though he has many.



But by Chorography you can better determine if the Known Figures are regular (in sides and angles). You can determine when the use of a Triangular arrangement is beneficial. You might find it strange dealing with Arithmetical figures in forming an arrangement for Battle, as their contents differ so much from those of Geometrical Figures.

The Herald, Pursuivant, Sergeant Royal, Captain (or whoever) can improve the judgement of his eye or his skill in Tactical Ordering by using Geometrical instruments, the Astronomer's Ring, and the Astronomical Staff (which is conveniently constructed to be portable). He may wondrously help himself by using a perspective Glass [early version of a telescope] which (I trust) in the future will be more refined than they are these days.

I have briefly reviewed a few of the Artificial Feats that use vulgar Geometry, but there are many Methodical Arts that are of great usefulness even though they lack the purity, simplicity, and Immateriality of our Principal Science of Magnitude.

*J.D.  
Friend,  
you may find it  
hard to perform  
my description  
of this Feat,  
as battlefields  
are not always  
regular shapes.  
Try breaking  
them down  
into triangles.  
Indeed, it does  
seem strange to  
mix battlefields  
and geometrical  
figures.*

### ***[Arts that are Derived from Arithmetic and Geometry]***

Here are the proper names of the Methodical Arts that derive from Geometry (and which are interrelated as well). **Perspective, Astronomy, Music, Cosmography, Astrology, Statike, Anthropography, Trochilike, Helioscopy, Pneumatithmy, Menadry, Hypogeiody, Hydrogogy, Horometry, Zography, Architecture, Navigation, Thaumaturgike and Archemastry.** It is essential I specifically describe each of these and explain their benefits in order to make this *Preface* a sweet, pleasant Nosegay [bouquet] for you, to comfort your spirits.

You may be almost out of courage and in despair (through brutish brute) supposing that Geometry is only useful for building a house, a curious bridge, the roof of Westminster Hall, or some witty, pretty device, or engine [mechanical device] and is only useful to a Carpenter or a Joiner or the like. By word and work, I will prove that the situation is far different than most people in the world commonly think.

Among these Arts, Perspective should be learned before perfect knowledge of Astronomical Appearances can be attained, and for good reasons. **Light is the first of God's Creatures.** The eye, the light of our bodies is its most mighty Sense and its most Artful and Geometrical organ. Therefore, we will begin with Perspective.

### ***[The Art of Perspective]*** [optics]

Perspective is the Mathematical Art which demonstrates the manner and properties of all Radiations—Direct, Refracted, and Reflected. This Description or Notation is brief, but it reaches as far as the world is wide. It concerns all Creatures, all Actions, and passions, and is performed by the Emanation of beams.

By Beams or natural lines I mean not only of light or of color (though they give show, witness and proof that the Art is grounded on), but also the certain and determined active Radial emanations of other Forms, both Substantial and Incidental.

By this Art (not including its highest points) we may use our eyes and light with greater pleasure and more perfect Judgement both in things seen in light and of other things which work and produce their effects similarly to the Radiation of Light.

We should be ashamed to be ignorant of the reasons why our eye is deceived and abused in various ways, like the way the eye perceives a far off Globe or Sphere to be a flat Circle on a plane, or the way a Square on a plane might appear to be round. Or the way distant parallel walls appear unparallel, or a flat roof appears to bend downwards or a flat floor appears to bend upwards. Or the way things moving swiftly appear to be moving faster when they are near and slower when they are distant. Or of when one thing is moving slightly slower than another, the slower thing appears to be standing still. These are all errors of the eye.

One should learn the reasons for the order of the Colors of the Rainbow, its size, location and height. It is pleasant, necessary and commodious for man to understand why two or three suns might appear at the same time, to know the cause of Blazing Stars and similar things caused quite naturally (yet signifying further matters).

Yea, isn't it greatly against the Sovereignty of Man's nature to be amazed and confounded right in front of his very eyes, like a Peacock's tail or the neck of a Dove, or a whole oar that seems to be broken when seen through water.

[The Greek Atomist Lucretius mentions all three of these examples (peacock tail, dove's neck and bent oar) in Book 2 of his work *De Rerum Natura*, On the Nature of Things]

A mar-  
velous  
Glass  
[Mirror]



Far off things can appear near. Near things can appear far off. Small things can seem large. Large things can seem small. One man can seem like an Army. If he doesn't understand perspective, a man might even be cursedly afraid of his own shadow.

Yea, looking into a certain mirror [concave] and drawing a dagger or sword towards the mirror you might suddenly stand aback in surprise at the image that appears in the air between you and the mirror. A hand, with sword and dagger will be stabbing back and do whatever you do in the mirror. This may sound Strange, but it's more amazing than words can describe.

S.W.P.

[Sir  
William  
Pickering]

Nonetheless, the reason for this effect can be explained by Optical principles. I won't get into the explanation here, but for those of noble courage who long ardently for the wisdom of Natural Causes, let him understand that he may find proof of this even here in London. A certain English gentleman (who is an Odd man in this land, but his skill in the Mathematical sciences and languages, and good service to his Country make him an honorable man) is able and (I am sure) willing to let this mirror be seen, thus proving my assertion. For the benefit of the honorable and to repress the arrogance of the ignorant with their malicious mouths, I here request him to let his Mirror and proof to be seen. Then you will better understand what I have described.

This Art of Perspective is excellent but no man would easily believe it without Actual proof. Without Perspective, Natural Philosophy cannot be fully understood. Without Perspective, Astronomy cannot be well grounded, nor can Astrology be verified and avouched for.



The part of Perspective which deals with Mirrors is called **Catoptrics**. It has too many marvelous and profitable uses to explain here, but the principal conclusions are already well known.

But before you have learned enough about the power of Nature and Art, you might not fully comprehend some parts of Perspective and slip into light Judgement of them, so I shall refrain from explaining them all here.

[Dee uses this expression, "the Power of Nature and Art" in the "Thus the World was Created" chart of the *Monas Hieroglyphica*]

### *[The Art of Astronomy]*

Astronomy is a Mathematical Art which demonstrates the distance, magnitudes, and all natural motions, appearances, and passions of the Planets and fixed Stars, for any time (past, present or to come) in respect to a certain Horizon or without respect to any Horizon. By this Art we can ascertain the distance from the center of the Earth to the Starry sky and each of the Planets, or how large any visible fixed star or Planet is compared to the size of the Earth.

By this Art we can ascertain that the Solidity, Mass, and Body of the Sun is  $161 \frac{7}{8}$  times the size of the Earth. And that the Body of the early globe and Sea is  $42 \frac{7}{8}$  times larger than the Moon. Thus, the Sun is  $6940 \frac{25}{64}$  times larger than the Moon. Yet the unskillful man would judge them to be the same size. Therefore, by Necessity one is much farther from us than the other.

The Sun, when he is farthest from the earth (which now, in our age is in the 8<sup>th</sup> degree of Cancer) is 1179 earth radii from the Earth. And the Moon, when she is farthest from the earth is  $68 \frac{1}{3}$  earth radii from the Earth. The nearest the Moon comes to Earth is  $52 \frac{1}{4}$  earth radii.

The starry sky is  $2008 \frac{1}{2}$  earth radii from Earth. Subtract the Moon's nearest distance from this and it makes  $20029 \frac{1}{4}$  earth radii.

The heavenly Palace is so thick that the Planets have all their exercise in, and marvelously perform the Commandment and Charge given to them by the Majesty of the King of Kings in the realm Genesis calls *Ha Rakia* [Hebrew for "the Expanse"]. Consider it well.

The radius of the Earth is  $3436 \frac{4}{11}$  miles. Its circumference is about 21600 miles. This makes each of the 360 degrees of a circle 60 miles.

If you contemplate this little parcel of Astronomical fruit regarding the size and distances of the Sun, Moon, Starry Sky and the huge mass of the *Ha Rakia* you will find your conscience moved and sing the confession of God's Glory and say:

*Note.*

The Heavens declare the glory of God, and the Firmament (*Ha Rakia*) showeth forth the works of his hands. And so forth, for the first five staves of that Kingly Psalm.

Well, well, it is time for some to lay hold on Wisdom and to Judge the truth of things. We ought not to simply expound the Holy word through Allegories and Neglect the wisdom, power and Goodness in God which can be seen and learned from his Creatures and from Creation. Holy Scripture declares to us very many Mysteries of the nature and properties of Creation by parables and Analogies.

To us, the Frame of God's Creatures is a bright mirror. By reflection it Rebounds our knowledge and perception, Beams, and Radiations of the Image of his Infinite goodness, omnipotence, and wisdom. Thus we are taught, persuaded, and thankful to Glorify our Creator as God.

Could the Heathenists find use for these most pure, beautiful and Mighty Corporeal Creatures? Can we find these uses after the true Sun of righteousness has risen above the Horizon of our temporal Hemisphere? It has so abundantly streamed into our hearts. Its goodness, mercy and grace has heat which All Creatures feel, heat which is both spiritual and Corporeal, Visible and Invisible. Shall we look upon the Heavens, Stars and Planets like the Ox or the Ass does, not wondering what they are or how they were created?

If we are to better understand why All Creatures were created chiefly to glorify the Almighty Creator by all means possible, we should (as *Plato* says in *Epinomis*):

*"Nolite ignorare Astronomiam, Sapientissimus Quidam esse"*

**"Do not be ignorant that Astronomy is a thing of excellent wisdom."**

From the beginning, Astronomy was commended, and in a way commanded, by God himself, as he made the Sun, Moon, and Stars for us as Signs, knowledge of the Seasons, and for the Distinction of Days and Years.



Men should take particular note of this word “Signs.” Consider it along with the tenth Chapter of Jeremiah. Some may think they have found a rod. But let modest reason be the indifferent Judge of who should be beaten with the rod if they don’t study Astronomy.

Leaving that, I pray you understand this: The Distinction of the Seasons, years, and New Moons cannot be understood without diligent Observation, examination, and calculation of the periods and courses of celestial bodies.

Knowledge of the Art of Astronomy is required for Understanding the Courses of Times, days, Years, and Ages as well as for the Considerations of Sacred Prophecies foretold in High Mystical Solemnities which will be accomplished in due time.

It is required for an understanding of other human affairs, like covenants between man and man, and many other great uses.

There would be great uncertainty, Confusion, untruth, and brutish Barbarity without the wonderful diligence and skill of this Art.

An Astronomical Staff is more useful than simple belief in learning and determining Times and periods of Time that are written about in the Records of the heavenly book.

### *[The Art of Music]*

The Original cause of Music is Motion. Having spoken about the motions (both swift and Slow) which are performed in the Firmament of Nature in the Art of Astronomy, I will now speak of another king of Motion, that which produces an audible Sound, and which (when made by Man) comes in numerous varieties. What I call the Science of Music, the Greeks called **Harmony**. (I will not meddle in the Controversy between the ancient Harmonists and Canonists.)

Music is a Mathematical Science which teaches (by sense and reason) how to perfectly judge and order the diversity of sounds, high and low.

As Plato says, Astronomy and Music are Sisters. Just as Astronomy was made for the eyes, the ears were made for Harmonious Motion. Astronomy has a more divine Contemplation (and commodity) than the mortal eye can perceive.

1. Music might also be considered more preferred to the \*Mind than the ear. And from audible sound we ought to ascend to the examination of which numbers are Harmonious and which are not and why some are and some are not.
2. I could enlarge upon the heavenly \*motions and distances and describe a marvelous Harmony, or Pythagoras’ Harp with eight strings.
4. 3. Also, same might be said of Mercury’s\* two Harps, each of four Elemental Strings.
5. And a very strange matter might be alleged of the Harmony appropriate to our Spiritual part as Ptolemy wrote about in his third book\* (Chapters 4 and 6).
6. \*And what is the cause of the apt bond or friendly fellowship between our Intellectual and Mental part and our gross and corruptible part? It is a certain Mean or Harmonious Spirituality which results from the participation of both of them.
7. There is a Harmony in the the \*Tune of a Man’s voice.
8. And certainly there is Harmony in the \*Sound of an Instrument.

The average Musician would hardly believe what might be said about Harmony. It is a Mixture (as I might call it) collation, or Application of these Harmonies, as of 3, 4, 5 or more.

Marvelous effects of these proportional considerations have been found and more may yet be found. These wondrous effects are useful to the State.

Democritus and Theophrastus write that griefs and diseases of the Mind might be diagnosed and cured by Music. Harmonic Consonance has accomplished marvelous things according to the Works of Terpander, Arion, Ismenias, Orpheus, Amphion, David, Pythagora, Empedocles, Asclepiades, and Timotheus. But I won't discuss them further here.

Commonly heard Music is so commodious and pleasant that I might make this claim: If it wasn't, more Musicians and Listeners would object to my definition of Music than would agree with it. The worthiness of this art is self evident (I wish other arts were as obvious), so I will spare you more explanation, and proceed.

J.D.  
Read in  
Aristotle's  
8 Books on  
Politics  
Chapters 5,  
6, and 7 and  
you will hold  
Music in  
much higher  
regard.

### ***[The Art of Cosmography]***

Of Cosmography I will give you some brief information. Cosmography is the whole, perfect description of both the heavenly and elemental parts of the world, their essential homologous application and mutual collation. This art involves Astronomy, Geography, Hydrography and Music. It is not the small, simple Art that many consider it to be. It matches Heaven and Earth in one frame and appropriately corresponds them. Thus, the Heavenly Globe might (practically speaking) might be described on the Geographical and Hydrographical Globe.

We should consider the Equinoctial Circle, the plane of the Ecliptic, Colures, Poles, Stars in their true Longitudes, Latitudes, Declinations and Verticality. [Colures are two great circles that intersect each other at right angles at the poles]

Also consider Climates and Parallels and (with a Horizon annexed) the revolution of the earthly Globe (as the Heaven is carried by the Primovant [Prime Motion] in about 24 equal hours).

Much has been written about these matters by Virgil in his *Georgikes*, by Hesiod, by Hippocrates in his *Medicinal Sphere* (written to Perdicca, King of the Macedonians) by Diocles (writing to King Antigona), and by other famous Philosophers.

Cosmography is essential for the timely manuring of the earth, for Navigation, for the Alteration of man's body whether he is healthy, sick, wounded, or bruised. It is essential to understand the Revolution or motions of the Cosmographical Globe, the Rising and Setting of the Sun, the Length of days and nights, the Hours and times (both day and night) and many other pleasant and necessary uses.

Many uses are known, but some remain to be discovered by someone clever enough to turn a small spark of a true fire into a wonderful bonfire.



### ***[The Art of Astrology]***

I make Astrology a separate Art from Astronomy, not by my own whim, but by good reason and authority. For *Astrology* is a Mathematical Art that reasonably demonstrates the operations and natural beams of light and the secret influence of the Stars and Planets in every element and elemental body, at all times and from any given Horizon.

This Art is informed by many other great Arts and experiences like perfect Perspective, Astronomy, Cosmography, the Natural Philosophy of 4 Elements, the Art of Graduation, a good understanding in Music, and moreover, another great Art, hereafter following, though I set this before for some considerations moving me. You see, these Arts furnish stuff to help make this rare and secret Art, but it is worthy enough on its own that deductive, logical conclusions can be drawn from it. The many and continuous travails of the most ancient and wise Philosophers in the practice of this Art and the examples of effects which confirm their works has provided sufficient proof and evidence, which we also may perceive everyday.

A man's body and all other Elemental bodies are altered, disposed, ordered, pleased and displeased by the Influential working of the Sun, Moon, and other Stars and Planets.

Thus, Aristotle writes in Chapter Two of his Meteorological books:

*"Est autem necessario Mundus iste, supernis lationibus fere coninuus. Ut, inde, viseius universa regatur. Ea siquidem Causa prima putanda omnibut est, unde motue principium existit."*

"Because this Elemental World is, by necessity, adjoining or next to that of the heavenly motions, these motions govern all its virtue and strength. The heavenly motions are the First Cause of Everything and thus the beginning of all motion."

Aristotle also writes in Chapter Ten: *"Oportet igitur & horum principia sumamus, & causas omnium similiter. Principium igitur ut movens, prapiciuuma & omnium primum, Circulus ille est, in quo manifeste Solis latio."*

[*"It is necessary, therefore, that we take up both the beginnings and the causes of all these things. Therefore, the special and first moving principle is the Circle, which is the way the Sun conducts himself."*]

His Meteorological books are full of arguments and demonstrations of the effect, virtue, operation, and power of the heavenly bodies have on the four Elements and other bodies which are made from the Elements, either perfectly or imperfectly.

And in Book Two, Chapter Ten of *De Generation & Corruptione* [*"On Generation and Corruption"* or *"On Creation and Destruction"*]:

*"Quocirca & prima latio, Ortus & Interitus causa non est: Sed obliqui Circuli latio: ea nama & continua est, & duobus motibut fit."*

In English this means: "The uppermost motion is not the cause of Generation and Corruption. The motion of the Zodiac is, because it is both continuous and is caused by two motions."

And in Book Two, Chapter Two of his *Physics*: *"Homa nama, generat hominem, ata Sol."*

He says: "For Man and the Sun are the cause of man's generation."

Numerous authorities can be cited from Antiquity (1000, 2000, and even 3000 years ago). These great Philosophers, Expert, Wise and godly men have come to the same conclusion which, daily and hourly we men may discern and perceive by sense and reason.

According to Aristotle, all Beasts feel and demonstrate (by their actions and passions, both outwardly and inwardly), and all Plants, Herbs, Trees, Flowers, Fruits, and all things composed of the Elements give Testimony that: Whole Dispositions, virtues, and natural motions depend on the Activity of the heavenly motions and Influences.

The perfect and cautiously observant Astrologer has to conclude that the heavenly Impression is responsible for the specific order and form of every seed and the Individual Matrix of things produced in Nature.

In the end, this conclusion can be drawn not only using reason, but by Natural and Mathematical demonstration.



I have here expressed which Sciences are requisite (without exception) to the Art of Astrology. In my *Propaedeumata Aphoristica* (among other matters disclosed there) I have provided Mathematical demonstration of the whole Method. I have not seen or heard of it so carefully explained by anyone before.

Twenty-one years ago I was provoked by certain earnest disputations of the Learned Gerard Mercator and Antonius Gogava (and others) to make my own diligent observations of Heavenly Influences down to the precise Minute of time (driven by my own constant and invincible zeal for the truth).

*In the Years 1548 and 1549 in the Louvain.*

Directed chiefly by the Supernatural influence of the Star of Jacob, [metaphor for Jesus; referring to the star that guided the 3 Wise Men] any Modest and Sober Student also carefully and diligently seeking the Truth will both find and confess there is Verity in my words. He might also become a Reasonable Reformer to help three sorts of People from greatly erring from the truth about these Influential Operations.

The first are the **Light Believers**, the second are the **Light Despisers** and the third are the **Light Practicers**.

Note.

The first and most common Sort think that the Stars in Heaven can answer any question or fulfill any desire.

1.

The Second sort deny that Influential virtue from heavenly bodies can bear any sway in Generation and Corruption in this Elemental world. Because the Sun, Moon and Stars (being so plentiful, so bright, so wonderfully large, so distant, having so many motions, being so constant in their periods; etc.) they assign them one or two simple characteristics and use the Sun, Moon, or the seven Stars as signs for their businesses here in London or for other such gross purposes of worldly affairs. They do not understand (or will not understand) the other workings and virtues of the Heavenly Sun, Moon and Stars.

2.

They don't understand these virtues the way a Mariner or a Farmer does. They don't even understand them the way an Elephant does, or as a Cynephalus does, [a mythical creature with the head of a dog and the body of a human] or even the way a Porcupine does.

They don't acknowledge that these perfect and incorruptible mighty bodies even has the Radiation and Force of a little magnet, (because these bodies are so distant.)

They think the Sea and Tidal Rivers (like the Thames) just ebb and flow, run in and out by themselves at their own fancy. God help, God help. These men fall short of understanding because they are either too dull, too willfully blind, and in some instances too busy being malicious.

The third Sort is the common, vulgar Astrologer or Light Practicer. Not being skillful or knowledgeable enough, either for vainglory or for personal gain, like a simple dolt or blind Horse (both in matter and in manner) purposefully errs. This sort brings discredit to the Cautious and modest Astrologer, robbing those most noble corporeal Creatures of the Heavens of their Natural Virtue.

3.

These noble Creatures are the most Harmonious in their Monarchy. They are the most mighty and the most beneficial to all elemental Generation, Corruption, and their subsidiary effects.

Properly understood and modestly used, we might highly and continually glorify God and his princely Prophet saying:

The Heavens declare the Glory of God who, in his wisdom, made the Heavens. He made the Sun to have dominion of the day. He made the Moon and Stars to have dominion of the night. Day-to-day he utters talk and night-to-night he declares his knowledge. Praise him. Praise all the Stars. Praise Light. Amen.

**[The Art of Statike]** [weighing things]

Next in order is Statike [Statics or the Science of Weighing things]. I will explain what it means and the commodities that are dependant upon this Art.

Statike is a Mathematical Art which demonstrates the reason for the heaviness and lightness of things, and of motions and properties related to heaviness and lightness.

Because the Balance is the chief instrument used, we call this Art Statike or the *Experiments of the Balance*. Oh, if a man became an able examiner and diligent practicer of this Art he would profit in many ways.

“ O God, who has made weight and Balance by thy Judgement, who has created all  
 “ things in *Number, Weight, and Measure*, who has weighed the mountains and hills in a Balance,  
 “ who has measured both Heaven and Earth in their hand, only you know all things precisely.  
 “ Thus, we who have been informed by the sacred word to consider thy Creatures, might catch  
 “ a glimpse or perceive but a shadow of the fact that you have revealed in these Creatures your  
 “ wisdom, might, and infinite goodness.

“ We should be aware that in your merciful goodness you have used three principal ways  
 “ in the Creation of all your Creatures, namely *Number, Weight, and Measure*.

“ As the two Arts of Number and Measure (the most famous, ancient and most essential  
 “ to human use) are already well known, we beseech you (through your accustomed goodness)  
 “ that we may obtain sufficient knowledge of this third key, *Weight*. You have purposely used  
 “ these three as Servants of your workmanship.

“ To glorify your name we should demonstrate (to the weaklings in faith) your wondrous  
 “ wisdom and Goodness. Amen.

To you my goodly friend, you Gentle and zealous Student, do not marvel at my devoted enthusiasm. Perhaps someday you will perceive what has caused me to feel this way. Now I will give you some ground and show specific benefits of using this Art. Because this Art is rare and my words seem dark and obscure, I will hold a light before the matter by showing you a few principal Conclusions demonstrated by Archimedes:

Conclusion 1.

At rest, the surface of all Liquid is spherical.

All liquid surfaces have the same center – the center of the Earth.

Conclusion 2.

If a solid shape is placed in a quantity of Liquid that is of the same size and weight,  
 it will settle downwards so none of it will be above the surface of the Liquid,  
 but it will still float within the Liquid.

Conclusion 3.

A solid shape, which is lighter than the Liquid, it will only partially sink in the Liquid.  
 The weight of the Liquid it displaces is equal to the weight of the Solid shape.

## Conclusion 4.

If this (Lighter than the Liquid) solid shape is forced down into the Liquid, it will try to move upwards with a force proportional to that difference in weight.

## Conclusion 5.

If a solid shape is heavier than a liquid it will fully sink and displace an equivalent weight of the Liquid.

## Conclusion 6.

If a Solid shape is lighter than a Liquid, it displaces only the amount of Liquid equal to its weight. The amount it sinks is proportional to the difference in weight.

*This can also be used to find weight proportions of non-rectilinear shapes, like spheres.*

Great errors in the judgment of the Natural Motions of Light things and Heavy things can be corrected by using these Truths. These errors are common among men who are too trusting of false Authority and misguided suppositions, for example: Given two bodies, the heavier moves downward faster than the lighter.

*Others have noted this Common Error*

This error was first noticed not by me, but by Giovanni Battista Benedetti [Italian physicist, 1530-1590]. Though it seems like a paradox, this is one of his main propositions: Two bodies of the same shape will move at the same rate whether they are equal or equal in weight. This holds true if both are in air, both are in water, or both are in something similar.

*A paradox*

Good discourses written on the feat of **Gunning** [trajectory of cannonballs] explore this principle, but due somewhat to the imperfection of Nature, it is challenging to demonstrate. These principles are widely used to determine the natural weights (of parts or of the whole) of Air, Water, Earth and Fire. The same principles also apply to Compounds of those Elements. They also apply to the proportions of the Humors in Man, their weights and the weight of man's bones, flesh, and etc. They can be used in many ways to determine the Force or strength of man.

*N.T.  
[Nicolo Tartaglia]*

*The wonderful use of these propositions.*

You may also use these principles to determine how much a ship weighs or how much water it draws, in either the sea or in fresh water. And (lifting your head aloft) you can measure the Diameters of the Sun and Moon by weight as precisely as by using any instrument.

Friend, I pray you, weigh those things with the just Balance of Reason and you will find Marvels upon Marvels. One Drop of Truth in Natural Philosophy is worth more than a whole library of Opinions, which can neither be demonstrated nor do they answer to Natures Law or your own experience



*[the Mathematics of weight, using a balance scale]*

*To learn the proportion between a Cube and Sphere using the practice of Statics.*

To complete this chapter on Statics, I will provide you with two or three practical applications. First we'll study the Mathematics of weight, using a Mechanician's instrument.

With the same Uniform substance, make a Cube and a Sphere. **Make the side of the Cube equal to the Diameter of the Sphere.** You can make them out of Wood, Copper, Tin, Lead or Silver as long as the stuff is consistently heavy. For the Balance Scale prepare a large number of small weights. So you can accurately measure up to six, eight, or twelve pounds objects. Know how many of your smallest weights it takes to counter balance these objects on the Balance Scale.

If you can't make the weights with precision, you may use clean sand. By continuously halving the sand, you will arrive at your smallest weight. (If you are using a pinch of sand as your first measurement, be sure to test your method). The Venetians use a method of halving 256 parts eight times [128, 64, 32, 16, 8, 4, 2, 1].

*J.D.  
Thus you have 256 parts of a grain.*

You will find that the cube and sphere are not of equal weight. Weigh the Cube and the Sphere separately using your small weights. You will find them to be in the proportion of 21:11. This you can see how the Mechanician or Experimenter can understand the proportion of the Cube to the Sphere without any knowledge of Geometry (which I demonstrate at the end of the twelfth book of Euclid).

After repeating your tests for confirmation, change the sizes of the Cube and Sphere until you have made a perfect universal Experience of the proportion. It's possible that you can find a ratio even more precise than 21:11.

*\* the proportion of a Square to a Circle inscribed within it.*

Once you have found this Drop of Natural verity, test it with other shapes. For example, make a solid Cylinder whose height and base diameter of a Solid Sphere. The ratio of the volumes of the Cylinder to Sphere is Sesqualiter or the ration of 3 to 2. Add to the Sphere another half of its weight and you will have the weight of the Cylinder.

*\* The squaring of the Circle, Mechanically*

As they are both in specific proportions to the Sphere, we can now compare the volumes of the Cylinder and the Cube. The Base of the Cylinder is a circle inscribed in the square base of the Cube. As the Cube and Cylinder are the same height, their volumes are in the same proportion that the square base is to the circular base. Now we can use Archimedes's great secret, which he deduced through practical Experimentation and great labor of mind.

Given any Circle, you can find a Square of equal size. Conversely, given any square, you can find an equal-sized Circle. This principle is the Squaring of the Circle.

I have provided an in-depth explanation in my Annotation to the Twelfth Book of Euclid. Through diligence you will find the proportion of a square to the circle inscribed within it to be 14:11.

*\* To generate a Circle equal to any given Square.*

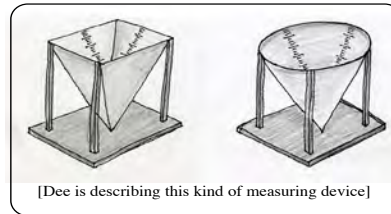
Using this proportion you can now determine the ratio of the Cube to the Sphere. We can also demonstrate this mechanically. Make a square of Gold or Silver plate and weigh it. Inscribe a circle in the square, then cut it out, filing the edges to precision. You will find ratio of the weight of the Square to the weight of the Circle to be 14:11.

As you can see, we can Square the Circle without even knowing the proportion of the Circumference to the Diameter [which is pi, 3.1416]. (Many have encumbered themselves superfluously by approaching that problem first which is not only intricate, but quite unnecessary).

There are many ways you can easily determine the Circumference once a circle's Quantity is known. I leave you to study this independently so we can move on to another Magistral Problem, which to this day has never been presented better than this:

***The Mechanical Doubling of the Cube,  
by conerting the solid cube's weight itno a liquid (water)***

Make a 4-sided pyramid out of 4 equal isosceles triangles made from copper or tin. Make it as geometrically perfect as you can, and leave the base open. A cone might also be used instead of a pyramid .



Inscribe marks dividing the height of the pyramid using different increments. Divide one internal face into 12 equal parts, another into 24 parts, another into 60 parts and the last into 100 parts.

With its vertex pointing exactly downward, build a frame to steady the pyramid.

Now we will see how to calculate double the volume of a given Cube. Make a perfect Cube out of Copper, Silver, Lead, Tin, Wood, Stone, or Bone. (Make it small enough so that 3 or 4 of them can fit inside the hollow pyramid).

Put the cube on a scale and balance it with an equal weight of water. Then pour that water into the hollow Pyramid. Note the measurement of the surface of the water. Repeat the process make note of the new level of the water.

Next divide the side of the cube into as many equal parts as you can. Now we can mathematically double the cube.

The ratio of the first water level mark to the second water level mark is equivalent to the ratio of the cube to a cube double of its size. To the ratio of the side of the original cube to the side of a cube double its size in volume. (This is proven by Proposition Twelve, Book Six of Euclid).

*To Double  
the Cube by  
Mechanical  
Art and with  
Mathemati-  
cal Demon-  
stration*

*J.D.  
The sides of  
this Pyramid  
must be 4  
equal Isosce-  
les Triangles.*

*Note  
Squaring the  
Circle without  
even knowing  
the proportion  
between a Cir-  
cumference and  
a Diameter.*

*J.D.  
Remember, in  
for some mea-  
surements you  
must empty  
the water from  
the Pyramid  
first.*

*Vitruvius,  
Book Nine,  
Chapter Three*

*God be  
thanked for  
this Invention  
and the ensu-  
ing fruits.*

*Note con-  
cerning the  
spherical  
surface of  
water.*



Now that we know the length of the side of that double cube, we can find its volume by cubing that length. Thus, I exclaim with joy, "EUREKA, EUREKA, EUREKA." I have have an even greater reason to thank the holy and glorious Trinity than Archimedes had after discovering the fraud in King Heiron's Crown of Gold.

To perform this same test without using a balance scale and weight, make your cube hollow (but water tight). Fill it with water and pour that into the hollow pyramid. Repeat that process. Then use the mathematics just shown to find the volume of the double cube.

Meanwhile, I have not forgotten my first Proposition in the Art of Statistics, that the surface of water is Spherical. To account for this, add a hair's width more to your measurement of the top surface of the water.

To be extremely accurate you could mathematically calculate the swelling of the water above level by finding the distance between the top of the water and the center of the earth. Knowing the width of the swell, you can use mathematics [The Pythagorean Theorem] to determine the height of the swell. Though the swelling is very real, its effect on your calculations will be insignificant. To further lessen the effect of swelling, moisten (with a sponge) the interior sides of the hollow Pyramid before conducting your tests. Experience will guide.

Using this process, you can double the Cube Mechanically, or even triple it (or more).

Now I will lessen your pain, cost, and care by showing you a simple method that does not involve using a Fundamental Cube as a unit of measurement. (That method served as a good demonstration, but it was not the shortest route.)

Take any amount of water (that will fit in the device with plenty of room to spare) and precisely weigh it. Then pour it into the inverted pyramid and make a note if its level.

Repeat that process with the exact same amount of water and make a note of the new level.

These two marks give you the proportion between the sides of two cubes, one of which is twice the volume of the other. (\*Thus we can have doubled the the volume of any cube without having to use a given, Fundamental Cube)

Proceeding with our drop of Natural truth, we can now find the proportion of the volumes of two differently sized cubes, whether that proportion is Rational or Irrational.



*\*Note*





\*Note this  
Corollary.

\*This same proportioning that applies that applies to two cones can als be applied to two square-based pyramids, or even to two parallelipedons [like the tall rectangular containers of the previous experiment].

Furthermore, this demonstration applies to a certain shapes besides square-based Pyramids or Cones. Consider this well.

[Dee might be implying a 5-sided pyramid or a 6-sided pyramid, (etc.), but its more likely he's hinting at a 3-sided pyramid (plus base), in other words a tetrahedron. As a cuboctahedron is made out of tetrahedra and square-based pyramids, this same proportioning method works with variously sized cuboctahedra].

I have been very long in words both Mathematically and Mechanically, but I trust it was not too tedious to those who find this information relevant to their work. To avoid prolixity I have omitted various things which could be easily explored which to the Mathmetician would be a great Treasure and to the Mechanician of great commodity.

\*The great  
Commodity  
of these new  
Inventions

\*You have now learned how to find two middle proportionals between two given lines in a hollow Parallelipedon, a hollow Pyramid or a hollow Cone.

In a rectangular Parallelipipedon, each corner is formed from 3 perpendicular edges or lines. Given a specific proportion of those 3 lines, similarly proportional rectangular Parallelipipedons can be found. (I have elaborated on this following Proposition 36 in Book II in Euclid).

Now, we can easily perform all those things that Vitruvius claims in his *On Architecture* can be done, like doubling the Cube or finding the two middle proportional lines between two given lines.

Now, that Problem which I explain in my Addition to Proposition 34 of Book II of Euclid is proven to be possible: Any regular body can be Transformed into another.

Now, any sphere or any Mixed Solid or any Irregular Solid may be made in any given proportion to a first, given body.

Thus, from a **Mannequin** (as the Dutch Painters call it) a Giant can be made having the same symmetry. The Mannequin can have any gesture and the Giant will have the same gesture (and vice-versa).

Now, from any Mold or **Model of a Ship**, you can make a similar mold in any give proportion either larger or smaller.



Now from any \***Gun** or small piece of ordinance you can make another (with the same symmetry in all points) as large or as small as you want. Think about how useful this can be.

There are an infinite number of ways you can apply this principle which has been sought for so long, so simply presented, and so willingly and frankly communicated to those who faithfully deal with virtuous studies.

Such is  
the Fruit  
of the  
Math-  
ematical  
Arts and  
Sciences.

Thus the Mathematical mind can deal Speculatively in its own Art (and by good means) mount above the clouds and stars. Also, it can Descend to frame Natural things to wonderful uses. Whenever he wishes, man can return home to his own Center and there prepare more Means with which to Ascend or Descend (all to the glory of God and our honest enjoyment here on earth).

Though the Printer has been asking for the *Preface* for a day or two, I could not bring my pen from the paper before I had given you a brief compilation of some of the commodities that are able to be reaped using the Art of Statike.

For the remaining Arts, therefore, I will be brief. The next Art is an endless Treasure. I could write about it fruitfully for a whole year, however I will glance over it with but a few words.

**[The Art of Anthropography]** [Man]

This is a restored Art, quite worthy of my commendation, which I call Anthropography. I pray you, think of it as one of the chief points of Human Knowledge. Though my name for it is new, the subject has been examined by all perfect Philosophers from the beginning.

Anthropography is the description of the Number, Measure, Weight, Figure, Location and Color of the many varied things contained in the perfect body of a MAN. It incorporates the certain knowledge of the symmetry, figure, weight, Character, and due local motion of any part of the given body and of the Numbers that pertain to these parts.

The final phrase in this Definition helps explain why it is considered a Mathematical Art. The description of the heavenly part of the world is called Astronomy. The description of the earthly Globe is called **Geography**.

The matching of both is called **Cosmography**, (the description of the whole and universal frame of the world). So why shouldn't the description of he who is in the Microcosmos or the Lesser World, (for whose sake and service all other bodily creatures were created, who participates with Spirits and Angels, and is made to the Image and similitude of God) have its own special Art? Instead of going unnamed or given a base and improper name like Microcosmology, it should be honored as the Art of Arts.

Depending on your profession you may wish to examine particular parts of this Art, as God, Nature, Reason and Experience shall guide your interests. The **Anatomists** will teach you part of this Art. **Physiognomists** [those who judge character from features of the face] will teach you another part. **Chyromantics** [those who read palms] will teach another. **Metaposcopists** [those who find a dominant quality of various bodies, quick as a dog, slow like the pig, forceful like a lion, etc.] will teach yet another part.

The excellent Albrecht Dürer helps explain much about the Eye, which is a substantial part of the Art of Perspective. Pythagoras, Hippocrates, Plato, Galen, Meletius and many others contribute to our understanding of other parts. To study what's left, the Heaven, Earth and all other Creatures offer their Harmonious service. Using your own Experience, perhaps you can Methodically explore the whole, for the sake of posterity.

There is good proof of our Harmonious and Microcosmical constitution. The Art of Zography (Painting and Sculpture) gives view of its outward Image.

To build man's Churches, Houses, Forts and Ships, the Art of Architecture is most necessary and profitable. Anthropology is the chief base and foundation of these Architectural structures

If you don't believe me, simply look at of \*Vitruvius

[Chapter 1, Book 3 is entitled *On Symmetry: In Temples and in the Human Body*].

Look at Albrecht Dürer's *On the Symmetry of the Human Body*.

Look in the 27th and 28th Chapters of Book Two of Agrippa's *On Occult Philosophy*

[entitled *Of the Proportion, Measure and Harmony of Man's Body; and of the Composition and Harmony of the Human Soul*].

Consider Noah's Ark.

And go even further. Remember the Delphic Oracle *NOSCE TEIPSUM* (Know Thyself) pronounced so long ago and so often repeated by many a Philosopher, and strived at by the Wisest.

Now you may perceive that these voices from so long ago are calling to you the School where this Art might be learned.

*MAN  
is the  
Lesser  
World  
[the  
Micro-  
cosm]*

\* 

\*Microcosmos  
Chapter 1,  
Book 3



I am not afraid of the distain of those who believe there are only Seven Arts and Sciences. Some, with enough ignorance and shame don't even say there are seven. Nobody can really say there are a certain number of Arts. And within each Art there are no limits to God, Nature, and Man's Inventiveness.

Every day New Arts are born. All the Arts of the world will never be known to one man, or in one land or even in one age. Let us embrace the gifts of God and the paths to wisdom in this time of grace from above which is continually bestowed on those who thankfully receive them. All goodness overflows with more goodness.

**[The Art of Trochilike]** [circular motion]

Trochilike, is that Mathematical Art which demonstrates the properties of all Circular motions, both Simple and Compound. Because the most basic functional use of circular motion is the wheel, it is called Trochilike, or as one might say, Wheel Art. In this Art a given Wheel can move others in many different ways. Two wheels can turn at the same rate, or in any given proportion.

A Wheel can describe a straight line. Also, it can describe a spiral line, an ellipse of a Conical Section, and many other Irregular kinds of lines. These geometric principles are utilized in many pleasant and profitable Mechanical works.

*Saw Mills*

I have seen Mills in Germany that saw extremely long boards with no manpower involved. In the City of Prague, in the Kingdom of Bohemia I have seen Mills for making coins and Mills for grinding corn. Mills and Wheelworks can be powered in many ways, by Wind, Smoke, Water, Weight, Spring, or by Man or Beast.

Read Georg Agricola's book, *On the Nature of Metals*, and you will see how essential Wheelwork is in Mining operations. Strange works have already been made using Wheels, and even more incredible inventions will be made in the future. One wonderful current-day example that will certainly be elaborated on is a clock which the Inventor [William Zenlander, in the 1300's] sold for a mere 20 Talents of Gold. It was accidentally broken, but was repaired by Janellus of Cremona [in the 1500's] and presented to Emperor Charles V. Geralmo Cardano testifies that one of its gears moved at such a slow rate it would take 7000 years to make a circuit – an almost unbelievable thing.

Many men, some still living, could testify that what I speak of is not that unusual.

**[The Art of Helicosophy]** [spirals]

**Helicosophy** is a close sister to Trochilike. It is a Mathematical Art which demonstrates the designing of all Spiral lines on a Plane, Cylinder, Cone, Sphere, Conoid, or Spheroid, and all the properties pertaining to them. This art is most useful in Architecture and in the design of various Instruments and Machines. In many instances, a Screw does what nothing else can do.

Athenaeus writes in Chapter 8, Book 5 [of *Diephosophists*, or *Banquet of the Learned*, around 225 AD], that all the manpower in the city of Syracuse could not move a huge Ship that was grounded, but Archimedes set up his Screw machine and King Hieron was able to operate it and remove the boat with ease. According to Proclus (page 18), the king was so struck by the wonder of it all he declared, "From this day forward, whatever Archimedes says is to be believed."

**[The Art of Pneumatithmy]** [air or water pressure]

Pneumatithmy demonstrates by using enclosed hollow Geometrical shapes (either regular or irregular) the strange properties (either in motions or at rest) of Water, Air, Smoke and Fire (either separately or together).

The Natural Philosopher can use this art to prove that there is no Emptiness in this world. Nature abhors a vacuum so much that, contrary to ordinary laws, Elements can be caused to move (or to stand still) [as in a straw]. If there is more space than there is air to fill it, water can be caused to ascend. Similarly, water can be caused to hang, and not descend, rather than leave behind emptiness. The same is true of Fire and Air. They will descend either when their Continuity has been dissolved or when they are forced by another Element. They cannot be extended to discontinuity nor can they be compressed or pent up in a space insufficient to hold their bodily substance, even using the force of man. They will use great force and violence to enjoy their natural right and liberty.

As a practical example, by keeping air in an inverted Cauldron, several men can descend to the bottom of the Sea and remain there for a while. Note that a thicker Element (like the Water) will relinquish its place to a thinner Element (like the Air) when it receives its violent force.

Pumps, all kinds of Bellows, and many other strange devices are based upon this Art. Many goodly works in Greek and Latin describe Hydraulic Organs that operated by water, a science commonly called Pneumatica [pneumo means "wind"].

What I call Pneumatithmy, the old and learned Scholars called Scientia de Pleno & Vacuo [the Science of Matter and Void].

**[The Art of Menadry]** [multiplying of a force]

Menadry is a Mathematical Art, which demonstrates how a Virtue or force can be multiplied so it can push, pull, lift or cast off a virtue weight or force, which is not naturally directable or moveable. [Menadrie is a term apparently coined by Dee]

Often this art is used in conjunction with other Arts like Perspective, Static, Trochilike, Heliocosophy, and Pnemathmy. Cranes, Gibbets and Machines use this Art to lift or force things in a variety of ways. The cause of this force is well-known.

The Dutch Rack uses this force allowing one man to upright a large, full wagon lying on its side. A Crossbow uses this force. It is the reason why one man with a lever can lift what six men couldn't lift using their hands. We have Cranes right here in London that can lift 2000 pounds of weight, with the help of two pulleys (properly arranged). It is estimated that a large enough crane can lift up to 200,000 pounds of weight.

Archimedes knew this Art so well that several times, single handedly, with his devices and machines, ravaged and utterly defeated an entire battle array of the Roman Army (led by the Supreme Roman Consul Marcus Marcellus), which had been besieging Syracuse. With his machines he rained so many huge stones on them that they were driven far away from the city. And likewise he hurled mighty stones at the ships that had come up to the walls of Syracuse, utterly confounding the Roman Navy. He was able to project 18 foot pikes almost a quarter of a mile\*.

*To go to the bottom of the Sea without danger.*



*\*These things are written about in Plutarch's Marco Marcello, Synesius' Epistolis Polybius, as well as in Pliny, Quintilian, Titus Livius, and Athenaus*

\*Galen and  
Anthemius  
write about  
this.

He devised a way to catch hold of the ships, hoist them above the water and suddenly drop them into the Sea again. He used \*Burning Glasses to set fire to distant Ships. For months the Romans were repelled from Syracuse. All their force, courage, and tactics couldn't contend with his devices and engines. The Romans gave Archimedes the name Briareus or Centimanus [the Greek and Latin terms (respectively) for a mythological giant having 100 arms].

Burning  
Glasses

Zonaras says that Proclus understood Archimedes' Art of Menadry so well that he devised large Burning Glasses. Placing them on the walls of Constantinople, he multiplied the heat of the Sun and directed the beams against the enemy Navy with such force that he set them ablaze (like lightening) destroying the ships and all the men.

Dion writes about a Geometer from Constantinople named Priscus who invented and uses a variety of machines using multiplied Force. Even though Emperor Severus conquered the city, he pardoned Priscus because he honored his Art, cleverness and skill.

Just as important as these machines of Force was the invention of the Gun. Though first  
“ invented in another land, an Englishman refined its design. He who has studied the history of  
Guns “ Guns is amazed how such a small, common thing (devised by wise men and handled by industrious men) could have such incredible force.

### ***[The Art of Hypogeiody]*** [tunnels]

Hypogeiody [*hypo* means under; *geo* means earth] is a Mathematical Art that demonstrates how tunnels can be planned and dug under the Spherical Surface of the Earth (at any depth) to end up under a specific remote location (if the distance and compass direction is known). This Art explains how a tunnel direction can follow a given track beneath the surface of the earth. And conversely, how an existing tunnel (straight or crooked) can be tracked from on the earth's surface.

This Art is very profitable to the Commonwealth in various ways. I invented this Art at the request of two Gentlemen. They both owned mines near the border of their lands. Because the tunnels were crooked and at various depths, they couldn't determine on whose property the tunnels were actually located. Upon settling their dispute I published a book entitled, *De Itinere Subterraneo* [On Travel Underground].

The rest is at God's Will. For foot soldiers who dig trenches, for miners digging for Metal, Stone, or Coal, for those digging for secret underground passages from place to place (and our country has many) and for other purposes, anyone can easily see the benefit of this Art. One can also see how much knowledge of Geometry helps in this Art of Hypogeidy.

### ***The Art of Hydragogy*** [water flow]

Hydragogy [*hydra* means “water”] demonstrates the possible ways of directing the flow of Water by Nature's Law [gravity] or by artificial means from any source (a Spring, Running Water, or Standing Water) to any other given location.



Marvelous works using this art have been made for a long time. Not only are they well documented, but their Ruins can be seen today, like the Roman Aqueducts in Italy. In other places Canals leading through the Mainland are Navigable for many miles. In other places, water is forced to Ascend.

Directing water in all these various ways demands great skill of anyone who is to be perfect in this Art. I won't get into details of how much Fall is required for every hundred feet of distance nor of how ventils [man-made sluiceways] should be designed to handle an overflow of too much water.

There are many experts who build waterways, without properly understanding the Geometry involved. Thus, they couldn't easily choose the optimum course leading from a high spring, crookedly down and around (and even over other high areas) to the final low destination. Geometry therefore is essential to Hydrogogy.

Vitruvius, Agricola, (and others) write extensively on the various ways to force water to ascend like a Tympane mill or a Kettle mill [types of windmills that pump water], the Archimedian Screw, or Ctesibius' water pump. [Ctesibius also invented the clepsydra or water clock (see Vitruvius, Book 10, Chapters 4-7); The Tower of the Winds in Athens was based on his design (see Vitruvius, Book 1, Chapter 6)].

So, its quite evident how the Arts of Pneumatithmy, Helicosophy, Static, Trochilike, and Menadry aid the art of Hydrogogy, and also how useful it is to the Commonwealth.

### ***[The Art of Horometry]*** [time]

Horometry is a Mathematical Art which demonstrates how, for any given location, the exact designation of time may be known. This definition sounds simple, but it has much deeper meaning than you might imagine. In antiquity, part of this Art was called Gnomonice. More recently it was called Horologiographia. And in English, it is called Dialing.

Ancient is the use, and more ancient is the Invention. Its use appears at least 2300 years ago when King Achaz invented a dial that worked by the Sun during the day and the Moon and Stars at night. *Kings 4:20*

To graphically design various kinds of Dials requires not just skill in Astronomy, but also Elemental, Spherical, Phenomenal (observational), and Comical Geometry.

It takes more than a talented Painter to prescribe the path of the Sun's shadow, (down to a hair's-width) for any regular surface in any given location. In my youth, I invented a way to accomplish this feat of determining how, using any Horizontal Dial, Mural Dial [wall dial or vertical dial] or Equinoctial Dial [tilted dial], at any given hour (provided the Sun is shining), to determine the Sign and Degree ascendant. These things are essential to predict the Rising of those fixed Stars whose Influence is mighty. But I won't delve into that here.

Man's affairs often require knowledge of Time at Moments when neither the Sun, Moon, or Stars can be seen. So industrious Mechanics invented a way to keep track of time using a consistent flow of Water. Vitruvius rightfully praises to the skies the famous Inventor Ctesibius. Later, hours were measured by running Sand. Then, using the Art of Trochilike, by weights. And lately by Trochilike without weights, using a Spring instead.

But all these methods require corrections over time not only because of the heavenly Equinoctial Motion [the Great Year], but also because of the inaccuracy of their own Operation.

*A perpetual  
Motion*

There remains (and I'm not speaking figuratively here) among the Philosophers, a more excellent, more commodious and more marvelous way than all these to Imitate the motion of the Primovant (or the first equinoctial motion) by using Nature and Art, which you shall understand more of by further search in weightier studies. [Dee seems to be hinting about a camera obscura solar disc sundial here].

And so, it is time to finish this Note about the delineation of Time, for our common and private affairs. Any man that wants to know how to spend his time, needs to know how to tell time.

### *[The Art of Zography]* [painting from life]

Zography [in Greek, Zoê means life] is a Mathematical Art which teaches and demonstrates how the intersection of all Visual Pyramids, made by any assigned plane (the Center, distance, and lights having been determined), may be represented by lines and proper colors. To explain all the properties and ensuing benefits of this notable Art would really require a whole Book. An expert Zographer must be skilled in Geometry, Arithmetic, Perspective, Anthropography and many other Arts. For the most excellent Painter (who is but the proper Mechanician and sensible Imitator of the Zographer) [Dee is referring to God, the Zographer of the Universe], is so skilled that Man and beast have thought that his paintings were really natural things and not artificial, that they were alive and not dead.

This Mechanical Zographer (commonly called the Painter) is marvelous in his skill and seems to have a certain divine power as he can depict absent friends as present and even give dead friends a continual silent presence not only with us, but with posterity for many Ages. Moving on, Consider how in Winter he can show you the lively view of Summer's Joy and riches. And in Summer exhibit the countenance of Winter's naked and doleful state.

Cities, Towns, Forts, Woods, Armies, indeed even entire Kingdoms (no matter how large or how far away) he can bring home with ease (to any Man's Judgment) as lively patterns. In one little house he can enclose (with great pleasure to the beholders) the lively portraiture of all visible Creatures, either living on earth, or in the earth, or lying in the waters, creeping, sliding, or swimming of any fowl (or even a fly) that is in the Air flying. He can most nearly match the Judgment of our eyes in respect to the Stars, the Sky, the Clouds, indeed even the show of the very light itself (that Divine Creature). What an amazing thing this is. He can represent things that don't event exist yet. In a sense, his Picture seems to have Created them.

To a skilled craftsman, isn't a Picture a great pleasure and useful commodity? Which of these would refuse the Direction and aid of a Picture? To the Architect, the Goldsmith and the Arras [tapestry] Weaver, a picture is extremely valuable. Is it not by Picture that we get great pleasure when we behold books on Herbs and Plants, portraits of birds, beasts, fish and even our own curious Anatomy?

And if Picture (by the skillful work of the Painter) is this commodious and marvelous, what shall we think of Zography, the Schoolmaster of Picture and its chief governor?

Though I don't mention Sculpture in my table of Mathematical Arts, all men can see how Picture and Sculpture are connected like Sisters. And both are extremely profitable in a Commonwealth. Excellent craftsmen have written great books commending both Sculpture and Picture, for example Giorgio Vasari, Pietro Aretino, Pomponius Gauricus and others.

In addition to these two Arts (and others) there is a certain odd Art called **Althalmasat**. It is much more beholding and useful to his Art than the common Sculptor, Entailer, Carver, Cutter, Engraver, Founder, Painter, (etc.) realizes.

[An Entailer is an Intaglio artist, a Carver makes figurines, a Cutter cuts in wood block, an Engraver engraves in metal more deeply than an Entailer, and a Founder is one who casts metal].

### ***[The Art of Architecture]***

Many might consider it improper to include Architecture among the Mathematical Arts because it is not worthy enough. To them I will provide good reasons why I dare do so. They might point out that I have defined Mathematical Arts as not dealing with material or corruptible things, but dealing with things which can be expressed using Number and Magnitude. They will claim Architecture unworthy because it deals with such gross, material works like the building of a house, Palace, Church or Fort. *An Objection*

First, remember that I include Architecture among the Mathematical Arts which are Derived from the Principal arts of Arithmetic and Geometry. Realize that some of these arts deal more with Natural things and matter perceptible by the senses, while others draw nearer to Simple and absolute Mathematical Observations. *My Response*

The Architect prepares, informs and guides the Mechanician who does the actual handiwork of building a house, Castle or Palace. He is also the final Judge in any decisions that must be made. As the chief master, the Architect is responsible for the Demonstrative reason and cause of the Mechanician's work. Working in Line, Plane, and Solid the Architect's work must be solidly based on the principles of Geometry, Arithmetic, Optics, Music, Astronomy, Cosmography—indeed all the Mathematical Arts in this *Preface*, as well as other Natural Arts.

As it is based on the principles of all these Arts, you can see why it should be include as its own Mathematical Art.

Let's hear from the two men I consider to be the two most perfect Architects:

One is the Roman Vitruvius who wrote *On Architecture* [ca. 25 BC]. He dedicated the *Ten Books* in this work to Emperor Augustus who ruled Rome at the time our Heavenly Archmaster [Jesus] was born. The other is Leon Battista Alberti of Florence, who also published *Ten Books on Architecture* [in 1452].

Vitruvius writes: [in his first sentence of Chapter 1, Book 1]

"Architecture is a science involving many disciplines and various kinds of specialized knowledge. All the work done by the builders is guided by the seasoned judgment of the architect. His expertise grows from practice and reasoning. Reasoning is what declares the final proportions of the work."

Vitruvius continues:

"In all things, but particularly in Architecture, there are two aspects to be considered, the significant and the signifier. The signified is the object spoke about [like a building]. The signifier is the reasoned demonstration based on established principles of knowledge. They are two aspects of the same thing."

Further along in Book 1, Chapter 1, Vitruvius writes:

"An Architect must be familiar with various Languages, skillful in Painting well instructed in Geometry, not ignorant of Perspective, equipped with knowledge of Arithmetic, familiar with History, a diligent student of Philosophy, have skill in Music, be not ignorant of Medicine, understand rules of Law, and have a firm grasp on Astronomy and the courses of Celestial objects."



Vitruvius clearly explains why an Architect must be familiar with all these Arts and disciplines:

“It is important for an Architect to have knowledge of Painting so he can more easily illustrate the work he proposes.

Geometry offers many aids to Architecture. First among them is the use of the Rule and Compass to facilitate drawing the building plans. On-site, this geometry is carried out using squares, levels and plumb lines.

Likewise, by Perspective, the Lights of heaven are well-led in the buildings, from certain quarters of the world.

By Arithmetic, the cost of the building is summed up, the measurements are calculated, and the important issues of Symmetry are resolved using Geometric principles and methods.

It is essential to thoroughly study Philosophy because it deals with many varied natural problems about the “Nature of things,” which the Greeks call *physiologia*.

One example of this is conducting water through Aqueducts. Parts of the course are downhill, but some are level, and some must actually go over high ground. In each of these situations water pressure will vary. Problems like this can only be solved by someone who has learned the natural causes of things by studying Philosophy.

In addition, anyone who has read the books of Ctesibus and Archimedes (or others who have written down such Rules) will not be able to fully appreciate their meaning unless he has been trained in these subjects by the Philosophers.

And an Architect must know Music in order to understand both Regular Music and Mathematical Music. This will help him fine tune the springs of Balists [which shoot heavy darts], Catapults, and Scorpions [a smaller catapult operated by one person].

Likewise, in Theatres, Bronze Vessels are placed in niches beneath the seats using mathematical principles. The Greeks called the *echeia*.

[êxô means “a returned sound or a ringing sound,” from which we get the word echo].

They are distributed in various places throughout the circular Theatre according to the Musical Harmonies of **Diatessaron, Diapente, and Diapason**.

[The musical fourth, fifth, and octave or the ratios 3:4, 2:3, and 1:2]

The actor’s voice, projected from the stage, would be amplified when it strikes these vessels, allowing the audience to hear a richer and more pleasing sound.

As for Astronomy, the Architect must know East, West, South and North, and the design of the heavens, the Equinox, the Solstices, and the course of the stars. Anyone who lacks knowledge of these matters will be unable to understand the Art of Horology.

As this worthy profession is garnished, beautified and stored with many varied skills and fields of knowledge, I do not think that someone can just suddenly proclaim he is an Architect. One must start from childhood and slowly climb the steps of these studies. Only after being trained in Languages, Arts, and Sciences will be able to reach the high Temple of Architecture.

But to those whom Nature has bestowed such ingenuity, skillfulness, and a good Memory that they have mastered Geometry, Astronomy, Music and the other Arts, and who have surmounted and passed the calling and state of Architects can finally become Mathematicians. Such men are rarely found, but here are a few examples from times past: Aristarchus of Samos, Philolaus and Archgas of Tarentum, Appolonius of Perga, Eratosthenes of Cyrene, and Archimedes and Scopinas of Syracuse. Using natural laws and mathematical principles they invented many kinds of Machines and Sundials, which they described in their books for the posterity.”

A Math-  
metician

These words (paraphrased in places) can all be found in one chapter in the Ten Books by the Incomparable Architect Vitruvius. [that is, Chapter 1, Book 1] If you were able to take this book in your hand and glance through it you would immediately agree: This is a Storehouse of all workmanship. It incorporates the Arts of Geometry, Arithmetic, Astronomy, Music, Anthropography, Hydragogy, Horometry and more.

*Vitruvius.*

Now let's listen to our other Judge, the Florentine Leon Battista Alberti, and briefly examine his views on Architecture [in his Prologue to Book 1]:

"Before proceeding, I must describe the man I would consider to be an Architect. As other Arts have Chief Masters, you might think the Carpenter to be the Chief Master of Architecture. But this is not so. The Carpenter is but an Instrument of the Architect.

*Who is an Architect?*

I consider an Architect to be that man who (by sure and marvelous reason and method) has the skill to devise (using his own mind and Imagination) and accomplish by, the movement of weighty material and the joining and framing together of bodies, that which is most beneficial for the worthiest needs of Man.

"  
"  
"  
"

To be able to perform these things, he must have an understanding and knowledge of the highest and most worthy disciplines."

[In Book 1, Chapter 1, Alberti continues:] "The whole Feat of Architecture in building consists of Lineaments [its distinctive lines] and Framing [structure]. The whole intent and purpose of Lineaments lies in determining the best way of coordinating and joining all the lines and angles that define all the faces of the building.

The function of the lineaments is to prescribe an appropriate location, precise numbers, proper scale, and elegant order for the whole building as well as for its various parts. Thus the entire form\* and appearance of a building may depend upon the Lineaments.

*\* The Immateriality of perfect Architecture*

Lineaments have nothing to do with the particular material the building is made from. Building made from different materials can have the same lineaments if they share similar siting, order, and all the lines and angles are similar.

Thus, **Lineaments** are all the precise and correct lines and angles of a building, first conceived in the mind, and then perfected by inspired vision and learned intellect."

*What a Lineament is.*

We thank you, Master Alberti. By setting aside the material stuff of the building, you have appropriately given your Art (and your description of it) a Mathematical perfection that involves thinking about order, number, form, figure, and symmetry.

Now, Gentle reader, it is evident why I consider Architecture to have been born and raised in the Dominion of the incomparable Princess Mathematica and to be one of her natural subjects. The word "Architecture" itself helps describe what distinguishes this Science from all the other Arts.

*„ Note  
"  
"*

As Plato affirms, the Architect is the Master of all other workers. He is neither a Smith or a Builder or any other Craftsman. He is the Head, the Provost, the Director, and the Judge of all Artificial works and of all Artificers. The true Architect is able to teach, demonstrate, administer, describe, and Judge all works made. And only he searches out the causes and reasons of all Artificial things.

Thus, Architecture is so excellent that, in our days, few endeavor to undertake it. But it should only be thought of as a virtuous pursuit.

Just because we have scarce few Artificers these days doesn't mean we should imperfectly redefine the ancient Arts anymore than we should pinch in the Definition of Wisdom, Honesty, Friendship, or Justice. No more will I consent to Diminish, in anyway, the perfection and legitimate dignity given to absolute Architecture.

Under the direction of this Art are three important Mechanical Arts, Housing, Fortification, and Naupegie [ship building].

Housing incorporates buildings made for Divine Service and for Man's common usage, whether public or private.

Strange matters might also be explained about Fortification and Naupegie. But perchance some will be weary of all this Bede-Roll [lengthy listing or cataloging]. Others might prefer I nicely nip my bulky and unrefined discoursing with you, made in post-haste. I wouldn't want you to lose interest in this true and friendly sampling of Mathematical Power. Life is short and uncertain. Times are perilous. And the Printer is waiting for my pen to stop. So let,s proceed to the remaining Arts with all speed possible.

### *The Art of Navigation*

The Art of Navigation demonstrates how a seaworthy ship may be conducted between any two given places by the shortest route and in the shortest amount of time. And, in the instance of storms and natural disturbances, the best possible revised route.

It is obvious that the Master Pilot requires knowledge of the Arts of Hydrography, Astronomy, Astrology, and Horometry, as well as the common Base and foundation of all Arts, Arithmetic and Geometry.

Thus he will be able to read the necessary Instruments, whether he has constructed them himself or they have been skillfully crafted by experts. He should be able to use the following:

The Quadrant, The Astronomer's Ring, The Astronomer's Staff,

The Universal Astrolobe, A Hydrographical Globe,

Hydrographical Charts

(true ones, not those with longitude lines that are parallel)

The Common Sea Compass, The Compass of Variation

The Proportional and Paradoxical Compasses

(which I invented\* at the request of two Master Pilots of the Muscovy Company)

Clocks with springs

Hour, Half-hour, and Three-hour Sandglasses and various other Instruments

He should learn the different ways the Paradoxical Compass can be used on a Globe or a flat map and also to be able to Calculate the Positions of the Planets at any given time.

In addition, he should know the exact Longitude and Latitude of his port of departure so when he pinpoints his existing location, he can keep a record of it in his ship's logbook.

By observing certain tempestuous fixed Stars, (and their Conjunctions, and their angular relationships with the Planets), and where these fixed Stars rise set (and their locations at Noon and Midnight) he should be able to predict Storms, Tempests, Waterspouts, and other Meteorological effects that are dangerous at Sea. For, as Plato says, the ability to change course when the times warrant is no less important in the Art of War than it is in Husbandry and Navigation.

\*In the  
Year 1559.



Besides all these clever techniques, the Navigator can look to the Sun and Moon for clues about weather, for example, as Virgil teaches us in *Georgics*:

Georgics 1

“The sun, too, will give signs when rising, And when setting into the waves.

The surest signs are provided by the sun.

Often we see various colors pass across its face.

Dark blue tells of rain; fiery-red means wind from the east.

But if the fiery-red is mingled with spots. Then a riot of storm-clouds and wind is on the way.

Let no man set sail on such a night. Or even untie his ship’s ropes from shore.

The sun will show you all these things. So who dare call the sun untrue?”

Likewise, there is great pleasure and profit in seeing certain symmetrical forewarnings (both at sea and on land) by carefully observing the Moon, Stars, Water, Air, Fire, Stones, Birds and Beasts.

So by all these examples, it’s clear how much the Art of Navigation needs and uses the other Mathematical Arts.

There is no need to elaborate on all the ways this country and others benefit from Ships and Navigation. But I feel obliged to discuss this.

And now, if I was to explain the many all the benefits coming to this Land (and others) because of Ships and Navigation you might think I’m using this occasion to use too many words when it’s unnecessary. But let me make this one important point:

In Navigation, none ought to take a greater interest to be skillful than our English Pilots. Perhaps many more men would be willing to come to the aid of our country if they had skills in Navigation. What a Privilege God has bestowed upon this Island by Situating it in a location most commodious for Navigation to Places most Famous and Rich.

And though lately\* a young Gentlemen and Courageous Captain was in great readiness, and with good hope, and with great motivation to have ventured for a Discovery. Either westerly (by way of Cape de Paramantia) [searching for the North West Passage around the tip of Greenland] or easterly (by way of Nova Zemla and the Cyremisses) [searching for the North East Passage above Russia].

\*In the Year  
1567  
S.H.G.  
[Sir  
Humphrey  
Gilbert]

But near his departure date he\* was called into the good service of his country, as the Irish Rebels have tasted. [Sir Humphrey Gilbert was still fighting in Ireland in 1569].

\*In the  
Year 1559

If this Gentleman is too engaged to make a voyage of Discovery, someone else should study the matter, listen to my advice, and consider venturing forth themselves.

Little by little we should becoming more knowledge able of the advantages that Trading Voyages can bring. I would be disheartened if, because of through indifference, inadequate Skills and lack of Courage, this opportunity was lost.

Half of the challenge is mustering enthusiasm. The other half is educating people about its wonderful advantages. It would bring great riches and worldly Treasure, mostly to this Land, but also to the rest of the Christian Commonwealth.

### ***The Art of Thaumaturgike*** [Wonderworks]

Thaumaturgike is that Mathematical Art which gives certain order to make strange works that can be perceived by the senses but are greatly wondered at by men

These Wonderworks are made in various ways. Some by Pneumatithmie, as in the Works of Ctesibus or Hero [using water pressure or steam pressure]. Some by Weight, as Plato speaks of in Timaeus. Some by the Tension of strings. Some have lively Motions caused by tightly wound Springs. Some by other means, like the Images of Mercury or the brass head sculpted by Albert Magnus, which seemed to speak [around 1250, Albert Magnus made a robotic head that could answer questions].

Cassiodorus [ca. 550 AD] writes that Boethius was skilled in inventing such devices:

“Your purpose is to know profound things and to show marvels. In the presentation of your Art, you have made Metal burn ablaze. You have made Diomèdes [mythological warrior] out of Brass which blows a loud Trumpet, a Bronze snake that hisses and birds which sing sweetly. These are but a few of the things we remember you for, you who can Imitate the heaven.”

\*In the  
Year 1551

At Saint Denys, in Paris\*, I (along with Oronce Finé and others) [French mathematician and cartographer 1494-1555] witnessed a strange self-moving several times. Others have written about it, and I hope it is still there to be seen.

Strange things can be done using the Art of Perspective, as I partially explained earlier. For example, to see aloft in the Air the lively Image of another man, either walking to and fro, or standing still. Similarly, to enter a house and see the lively show of Gold, Silver or precious stones, then attempting to grab them with your hand, only to find nothing but Air.

An Account  
of Extraordi-  
nary Events  
of this  
World,  
Chapter 8

Some men, though wise in other matters, have shamefully overshot themselves by misjudging the means used to create these wonderworks. As Claudius Celestinus writes:

“Nowadays, some Men, even of great learning and reputation, have Judged certain works to be so marvelous that they are above the power of Nature. But anyone skilled in the Art of Perspective could easily have explained the Cause.”

Tusculan  
Disputa-  
tions.  
Chapter 1

Marcus Tillius Cicero, recounts the very strange Sphere designed by Archimèdes “When Archimedes fastened the movings of the Sun, Moon and the five other Planets in a Sphere, he made the world, just as the God did (in the Timaëus of Plato). By turning one crank, they all moved at various rates, some slow, some swift.”

Even more amazing is that Claudianus reports it was made of Glass.

Angellius writes that the Mathematician Archytas made a Dove out of wood that could actually fly.

Plato writes about strange Images in Dadalus. Homer writes about Vulcan’s Selfmovers which moved by means of secret wheels. (Aristotle mentions both of these in his book *Politics*.)

Much of the workmanship in days long past was simply performed by cleverly using the principles of Trochilike and related Arts. In Nuremburg, a fly made out of Iron, being let out of the Artificer’s hand, flew about all the guests at the dinner table. After a while, as though it were weary, it returned to its mater’s hand again.

Also an Eagle made from wood flew out from Nuremburg a long distance to salute Emperor Maximillian, then returned again, waiting from him at the city gates.

[Dee’s friend Peter Ramus wrote about the Iron Fly and the Wooden Eagle made by Regiomontanus around 1471].



\*

\*Thus, you can see that what wonders Mathematical Art can perform when Skill, Will, Industry, and Ability are duly applied to proof.

### ***[Dee’s diatribe against malicious accusers]***

A Digression  
Apologetical

For these and similarly marvelous Acts and Feast that are naturally, Mathematically and Mechanically contrived and made, should any honest student and Modest Christian Philosopher be called a Conjurer?

Should the folly of Idiots and the Malice of the scornful prevail over He who seeks no worldly gain or glory from them ,but only seeks from God the treasure of heavenly wisdom and knowledge of pure truth.

Should he that seeks (as St. Paul describes it) in Creature’s Properties and wonderful virtues to find just cause by which to glorify the Eternal and Almighty Creator be robbed and pillaged of his honest name and fame?

Should that man be (in hugger mugger) [clandestinely] condemned as a Companion of the Hell-hounds, or a Caller and Conjurer of wicked and damned Spirits? Some claim they don't have time for all this learning, but its the only way to Godly Wisdom and Truth.

It takes a long time to absorb all the delights of Godly Wisdom and Godly Truth. Do you think such a learned man would waste his time with the Chief enemy of Christ our Redeemer, the deadly foe of mankind, the subtle and shameless perverter of Godly Truth, the Hypocritical Crocodile, the Envious Basilisk [serpent] who continually desires, in the twinkle of an eye, to destroy all Mankind, both in Body and Soul, forever?

Surely (to speak for myself) I have not learned to make so brutish and so wicked a Bargain. I have suffered in many ways in order to attain good Learning and Wisdom. In the past 20-25 years of Study I have spent 2-3 thousand marks, traveled 7-8 thousand miles, in all kinds of weather, using all kinds of transport, early and late, in danger of violence by man, in danger of destruction by wild beasts, in hunger, in thirst, in perilous heat by day, walking on foot in dangerous damp of cold by night, and risked my life by lodging in unsafe places.

Why (I pray you) for all this (safely, by God's mercy) should I have fished with a net so large and costly, and that has taken such a long time to draw up (with the help of Lady Philosophy and Queen Theology), only to catch\* a Frog? Nay, only to have caught a Devil? This is what the Common peevish Prattler Imagines and Jangles about. This is what the Malicious scorner says, so brazenly, behind my back. Ah, what a miserable kind of Man this is. He is bold, but blind to the Multitude of things above his Capacity.

*\*From the proverb, "He had fished well, but caught a Frog."*

What a Land. What a People. What Manners. What kind of times are these? Have these men become Devils themselves? By bearing false witness against their neighbors, will they also become Murderers? Perhaps God has forgiven them for this horrible slandering of the guiltless, but then they continue to do it. Why do the Innocent obtain from enforcing the full extent of the Law?

Why do the Innocent bystanders disregard the Charitable patience of he who has been slandered? Why do they not help enforce the full extent of the Law against these men as they continue to forge, fable, rage, and raise slander in Spoken Word and Print? Do they fear their Names will also be Noted to the World in word and Print with various devices, fables, beastly Imaginations and unchristianlike slanders?

Well, Well, my unkind Countrymen. O unnatural Countrymen. O unthankful Countrymen. O Brain-sick, rash, O spiteful and Disdainful Countrymen. Why do you violently oppress me with your slanders, contrary to Truth and contrary to your own Consciences?

In word, deed, or thought have I ever been hurtful, damaging, or injurious to you and yours in any way? I have so long, so dearly, so carefully, so painfully, and so dangerously sought and travailed to learn Wisdom and attain Virtue, and in the end (in your judgment) I am worse than when I began.

Worse than a Madman. A dangerous Member of the Commonwealth. Not a Member of the Church of Christ. You call this Learned? You call this being Philosophers or lovers of Wisdom? To forsake the straight heavenly path and wallow in the broad path of damnation? To forsake the light of heavenly Wisdom and lurk in the dungeon of the Prince of darkness? To forsake the Truth of God and his Creatures? To flatter the Deceitful, Crafty, Obstinate Liar an continual disgracer of the ultimate power of God's Truth? To forsake Eternal Life and Bliss and cling to the Author of everlasting Death, that Murderous Tyrant who most greedily steals Man's Soul?



Well, I thank God and our Lord Jesus Christ for the Comfort I get from the Examples of men who have lived before my time. Though I am unworthy of being compared to them in godliness of life or in perfection of learning, but they sustained the very same (or rather greater) Injuries that I have had to withstand.

Plato's *Apology of Socrates* (that patient man) will testify to this. The *Apology* written by Apuleius reveals the Brutishness of the Multitude. Pico de Mirandola's *Apology* will teach you of the Raging slander of the Malicious Ignorant against him. In Johannes Trithemius' *Apology* you can read his public Prostetation against the Rude Simple, some of whom were considered to be the wisest sort of men. There are so many more I can't count them all.

I loathe the Foolishness and Malice of my Native Countrymen who cannot digest any extraordinary course in Philosophical Studies that does not fall within the Compass of their Capacity or where they are not made privy to the true and secret cause of such wonderful Philosophical Feats.

These men generally fall into four categories: The first I call Vain prattling busy bodies. The second, Foolish Friends. The third, Imperfectly zealous. And the fourth, Malicious Ignorant. Let me briefly say a word or two to each of these, then I will return to my *Preface*.

**Vain prattling busy bodies:** Use your idle assemblies and conferences for something useful instead of talking of matters too difficult for your Capacities or contrary to your Consciences of what you Know is True.

**Foolish Friends:** Depart, rather than shower someone who is not really your friend with blind affection. Just because he knows more than the common student you declare that he must be a skilled Conjurer. By advancing his fame this way you make other men marvel at your good fortune to have such a talented friend.

Cease to spread Irreverence while you pretend Amity, pretending your tongue to be true while really being an Untrue friend (to God and his Dominion as well). Such Friends and Foolishness I shake off. I renounce you. Shake off your Folly.

**Imperfectly zealous:** Perhaps you mean well, but you miss the Mark by far if you kill a Lamb to feed his blood to the flock. Lamb's blood provides no natural sustenance to Sheep. Christ's flock is not nourished by your horrible slanders, nor are your pretenses well-graced at all by your rash ragged Rhetoric. Those who use me this way will find a foul Crack in their Credit. Speak only about what you know. And learn what you know. Don't believe heresy which endangers someone's life. Search to your heart and let Charity be your guide.

**Malicious Ignorant:** What shall I say to you? "*Prohibe linguam tuam a malo. A detractone percite lingua.*" "Cause thy tongue to refrain from evil. Refrain your tongue from slander." Though your tongue is sharp like that of a Snake and the poison of an adder lies on your lips, think first and take heed of what you say.

"*Vir linguosus non stabiliatur in terra. Virum vilentum venabitur malum, donec praecipitetur.* For, sure I am, "*Quia faciet Dominus ludicium afflicti: & vindictam pauperum.*"

"A talkative man will not be stable [or firm] on earth. Trouble will hunt down a violent man, until he is taught." For, sure I am, "Because the Lord will bring about judgment for the afflicted, and protection for the poor."

Thus I ask my true friends, and Countrymen (you Mathematicians, Mechanicians, and Philosophers, both Charitable and discreet) help me silence the untrue tongued, my envious Adversaries and all false Foolish friends.

Furthermore consider how Basilius Magnus presents Moses and Daniel before the eyes of those who consider Philosophical Studies like mine to be ungodly or unprofitable.

Weigh well what St. Stephen says about Moses: “*Eruditus est Moses omni Sapientia AEgyptioru & erat potens in verbis & operibus suis.*” “Moses was instructed in all manner of wisdom of the Egyptians and he became powerful both in his words and works.”

The Acts 7.

The Philosophical Power and Wisdom of Moses was not unlike that of the Holy Ghost. Yet Pliny called Moses a wicked Magician.


Moses might have learned his Philosophical wisdom before leading the Children of Israel or perhaps afterwards, when he performed wonders for the King Pharoh. Saint Stephen holds Moses’ Philosophy in high esteem in his Recapitulation of the Old Testament at his martyrdom (when he was full of the Holy Ghost). Basilus Magnus avouches that Moses’ wisdom served him well (not to mention how it served the church of God).

Regarding Moses’ wonders done before the King Pharoh, God himself said: “*Vide ut omnia ostenta, quae posui in manu tua, factas coram Pharone*” Which translates, “See that thou do all those wonders which I have put in thy hand before the Pharoh.”

You can see how rashly Pliny has slandered Moses, accusing him of vain fraudulent Magic saying: “*Est & alia Magices Factio a Mose, Iamne, & Iotape, Iudaeis pendens: sed multis millibus annorum post Zoroastrem. etc.*” “There is also another sect of magic, deriving from the Jews—Moses, Iamnes, and Iotape, but this was after Zoroaster by many thousands of years.”

Book 30,  
Chapter 1

Let all who are even Inferior to Pliny in Judgment and skill of Philosophy take heed, lest they overshoot themselves rashly in judging Philosopher’s Strange Acts and the Means by which they were done. Furthermore, beware of faking, scheming or imagining monstrous, unnatural feats when none were actually done (especially if there is not a spark of truth to it).

1.  
”  
” 2.   
3.

But most of all, those that Foolishly and Maliciously devise, then devilishly attribute their new found Monsters to me, let them be ashamed in front of their fellow Men. Let them dread and fear the Just Judge. I hope that time will show that I am Innocent in hand and heart and have not trespassed against God or Man in any of my Philosophical and Mathematical Studies and Exercises.

### ***The Art of Archemasonry***

**[Experimental Science, certifying something by experience]**

Now I end with Archemasonry. This art is rare, but the name is not new. Another Art under this one has been imbued with this English name before. [Nicholas Clulee notes that the English alchemist Thomas Norton uses the term, which means “full of mastery”]

This Art teaches how to actually experience all the worthy conclusions proposed by all the Mathematical Arts and by true Natural Philosophy and put them in a broader scope in terms of these same arts. Also, by using proper methods, and in peculiar terms, it helps these Arts to become complete Experiences which cannot be challenged.

If you recall how we put the Art of Architecture above all common handiworks, you might have some idea of the powerful authority of this Science. I sometimes call it a Science rather than an Art because of the excellency and Mastership it has over so many mighty arts and sciences. And because it starts with Experience and then searches forth the causes of conclusions (and applies them to the Experience) it is called Experimental Science. This is what Nicolas Cusanus [Nicholas of Cusa, 1401-1464] calls it in his *Experiments Statistical*.

Another Philosopher, Native to this land (and whose flower of worthy fame can never die or wither) wrote extensively about it at the request of Pope Clement VI.

R.B.  
[Roger  
Bacon.]

The Art carries with it a wonderful Credit. Using reason, it certifies to all the senses, fully and completely, to the utmost power of Nature and Art. It certifies by complete and absolute Experience.

The other Arts have Arguments and Demonstrations that persuade and, in words, prove their Conclusions\* very well.

Words and Arguments do not certify things like our senses do. They are not the full and final fruit of Sciences that can be practiced. And though some of the Arts incorporate Experiences, they are not complete, not brought to the ultimate test: the senses.

For example, the Natural Philosopher debates issues and tries to draw the best conclusion. The Astronomer and the Optical Mechanician learn some things by observable Experience, but not everything.

This is where the Archemaster steps in and pursues more Experience by using his Experimental doctrine. This makes Archimastery the chief and final power of the Natural and Mathematical Arts. I have read and heard of the two or three men who left good record of this Description of Archemastry.

This Art involves fantastical Imagination. Some Sophister might, *cum suis insolubilibus* [by his riddles], claim something to be irrefutable with a flourish and dazzle your Imagination and destroy your honest desire and Courage from believing these things, so unheard of, so marvelous and such Importance.

Well, do as you will. I have forewarned you. I have done my part as a friend. I have discharged my Duty to God and at his most merciful hands received my final accomplishment.

The **Science Alnirangiat** does Archemastry great Service. Muse nothing of his name. This is its proper name, I have not changed it. It has been used and published in Print by other men. Under this comes **Ars Sintrilla** which was briefly discussed by Artephius. But the chief Science of the Archemaster (in this world) is another (as it were) OPTICAL Science, whose name shall be told (God willing) when I shall have some (more just) occasion to Discourse upon it.

[Nicholas Clulee writes that these two arts with Arabic names refer to the art of divination and suggests that the “optical” art is scrying.]

Here I must end abruptly Gentle friend and undaunted lover of honest and essential truths. For those who have (for your sake) requested me (an old forewarn Mathematician) to take pen in hand (through the confidence they had in my long experience and tested sincerity) for declaring and reporting the benefits of the Mathematical Arts. To satisfy the Printer’s request, forthwith I will end this new attempt (and so costly) in a matter so slenderly (up till now) considered or esteemed among the common Sort of Students.

**[this book is intended for scholars who are not necessarily University students]**

1. I have been asked to explain why this book on the Principle Science of Geometry, entitled *Euclid’s Geometrical Elements* is written in our vulgar Speech of English and is intended for people who don’t know Latin and are not University Scholars. (Truthfully, I think such an explanation is unnecessary.)



My intention is not to diminish the Honor and Esteem of University Students and those who have Graduated. You too will Benefit from this work, even though it is intended for those who are not as privileged. 2.

The whole Mathematical Quadrivium exists in **French**, but the Universities of Paris or Orleans (and others) are not offended.

Nor in **Germany** have the famous Universities been at all discontent with Albrecht Dürer's Geometrical Institutions written in **Dutch**, or with Gulielmus Xylander's learned translation of the first six books of Euclid into high Dutch. Nor with Gualterus H. Riffius' Geometrical Volume, very diligently translated into the high Dutch tongue.

Nor do the Universities of **Spain** and **Portugal** consider their reputation decayed or suppose any of their Students hindered by the Mathematical works of the Excellent Pedro Nunez written in his vulgar language. Neither will be Studies of University Students be hindered by it.

The students at the **Italian** Universities (like the Academies of Bologna, Ferrara, Florence, Milan, Padua, Pavia, Perugia, Pisa, Rome, or Sienna) do not find themselves disgraced nor are their studies at all hindered by Luca Pacioli or by Nicolaus Tartaglia who have published Eudlid's Elements, some of Archimedes work, and large volumes of Arithmetic and Practical Geometry, all in their vulgar language, Italian.

Indeed, how the Common scholar (or even Grammarian) who will be shortly attending a University can now be sufficiently instructed in Arithmetic and Geometry (as Plato recommended) and be better prepared for all kinds of **Academical** [Platonic] or **Peripatetical** [Aristotelian] **Philosophy**. Thus, he will proceed more cheerfully, more skillfully, and more speedily forward in his studies to be learned there. Saving time, he can profit in other ways. 3.

Also, many young Gentleman or fertile English wits who never intended to meddle with the profound search and study of Philosophy (generally learned in the Universities) may now more easily sharpen their wits where otherwise they might be spending their time in foolish exercises that serve neither God, the Commonwealth, or their families. 4

And the Universities may have great Comfort with good hope that because of this English Geometric and Mathematical *Preface*, they will now be more esteemed and necessary. For when it becomes well-known that such great commodities result from the study of the Mathematical Sciences and the unlatined students have tasted such rare fruit (that heretofore has not been so fully clarified), all men will realize that far greater assistance in understanding the Perfection of all Philosophy may be had in the Universities (the Storehouses and Treasury of all Arts and Sciences essential for the best and most noble State of Commonwealths). 5.

Aside from this, how many Common Craftsmen are there in the Realms of England and Ireland who deal with Number Rule and Compass, who, with their own Skill and experience will be able (by this good information) to figure out and devise new works and exceptional new Machines and Instruments of use to the Commonwealth, private pleasure, and the better maintaining of their own prosperity.

“ Universities  
 “  
 “  
 “  
 “

I will not (therefore) fight against my own shadow. For no man (I am sure) will open his mouth against this Enterprise. For no man who has Charity towards his brother's furtherance in virtuous knowledge, no man has any care and zeal for the bettering of the Common State of this Realm, no man who cares not what wise men (either Sages or those fixed in their ways) thinks of him, no man (I am sure) will open his mouth against this Enterprise.

Nor will I make an Apology to anyone for doing this virtuous act, for setting forth Profitable Arts to the Englishman, in the English tongue.

But unto God our Creator, let us be thankful that:

☞ „ **He, of his Goodness, by his Power, and in his wisdom has Created all things in Number,**  
 „ **Weight, and Measure.**

„ Through his great Mercy he has revealed the Means with which to sufficiently understand these  
 „ three principal Instruments. I have given you abundant proof that these Means are the Mathematical Arts  
 and Sciences.

In my Mind there is so much more I would like to write about then matters, but I am pinched for time. But I have no doubts that if you are provoked by virtuous zeal and honest Intent to read and study this Compendious treatise, its fruits will give you great pleasure. [“Compendious” means essential facts presented concisely].

*The  
Ground-  
plat  
of this  
Preface in  
a Table*

So you can more easily perceive and better remember the principal points of my *Preface*, I have summarized it in a Groundplat or table (in the order in which they were presented)

If Haste has caused my poor pen to stumble anywhere, surely you will forgive me,  
 (as it is my earnest and sincere intent to please you). Consider the  
 huge rocky mountains and the perilous unbeaten pathways  
 which this pen has toiled and labored through (both  
 night and day, for a while) to bring you this good  
 News and Wonderful proof of Virtue's fruit.

For the rest, I entrust you to God's Merciful direction, heartily beseeching him  
 to help make your studies and honest Intents flourish, for his Glory,  
 and for the Benefit of our Country. *Amen.*

*Written at my poor House  
 At Mortlake,  
 In the Year 1570, February 9.*



PARALLATICAЕ

Commentationis Praxeosq;

Nucleus quidam.

*Authore Joanne Dee ,  
Londinensi.*



L O N D I N I  
*Apud Johannem Dayum Typo-  
graphum. An. 1573.*



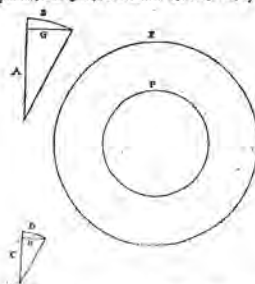




*Parallaticus Nucleus.*

Nam, per Archimedis demonstrata, Omnium Circularium circumferentias, ad suas semidiametros, unicam eandemq; habere rationem, demonstrari potest: rationalem illam quidem et irrationalem: (ut vulgari Logillarum utamur phrasi) quare & permutatim, et Circumferentia ad circumferentiam, sic (semidiameter ad semidiameter).

Sint ergo duæ semidiametri,  $A \& C$ : circumferentia autem circularum, ab illis descriptorum sint  $E$ , &  $F$ :  $E$  quidem, ab  $A$ , &  $F$ , à  $C$ . Sit etiam  $B$ , arcus ex  $E$ , desumptus.



tus & D arcus, illi similis, ex F, receptus. Sit etiam ipsius  
B arcus, sinus rectus, G recta linea: & arcus alterius, huic  
similis, nimirum D, sit H recta, sinus rectus. Cum verò, B,

*Parallaticus Nucleus.*

ad E, eandem habet rationem, quam D. Ad F: (quia B & D sunt arces fortiores, ex hypothesis) Ergo permutando, habet D eandem habet rationem quam E ad F. Sed quam habet E ad F, eandem habet A ad C (ut demonstratum est): per undecimam, igitur, quinti. Eandem, eadem citi ratio B ad D (similium arcum inter) se, que est A, ad C: (similium arcuum, scilicet, arce). Sic, prima Quæstio parit causam. Per Porphyrum præcedens, G finem rectius ipsius B, uel H, finem rectius ipsius D, est effici A ad C. Similiter, ratio se habet finem rectius C, secundum ipsius B, ad finem rectius secundum ipsius D, per idem Porphyrum. Sed per priorem causam demonstratam partem, uel A ad C, uel B ad D: ergo per undecimam, quinti. Elementorum, uel C ad H, five finem rectius ipsius B, ad finem secundum ipsius D, sic, B ad D. Omnium quodam finium arcum, eadem est inter se ratio, que secundum eandem respondent, five finium finium rectora primorum, uel secundorum, inter. *Unde demonstrata oportuit.*

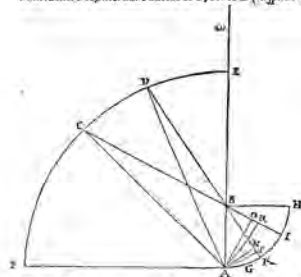
*Theorema. 3.*

In duabus quibuscunque, diuersis, eiusdem Stellæ similifus Phenomeni, Parallaxibus (modò interea, diurno Totius solmi ferri concipiatur motu) eadem ratio erit, sinus recti, maioris Parallaxeos, ad sinum rectum minoris: quæ est sinus recti, maioris à vertice distantie apparentis, ad minoris distantie apparentis, sinum rectum.

**S**it Terra Physicæ centrū, A. Speculatoris oculū, B. Dū-  
cator inter A & B, recta linea A B. Quæ in contrariū  
est directū, versus partes B. extendatur. In qua occi-  
piatur punctum u, prolio quod dicitur Zenith nostrum  
exelleit. Tū centra B, & intervallo B A, describitur qua-  
ta circuli pars: cuius circumferentia notetur literis A G H.

*Parallaticus Nucleus.*

Ducta sit recta BH, angulum cum AB linea, comprehensa rectum. Sit verò Phenomenon aliquod, quod in Sublimi spectatur : & in duobus diversis locis, viz in C quidem longiori a vertice distanti Apparente : & in D spacio Apparente verticali minori : ita ut per nullam interea, præter Totius motum, & agitur ipsum admittamus Phenomenum. Centro A interno autem A C, vel A D (in libris,



terreno ubi concentrica: ex solius diurni motus hypothefi  
defcribitor circuli portio F C D E: lineam A  $\omega$  sua fecan-  
circumferentia, in puncto E. Ita quod puncta A, B, E, in  
eiusdemque flatu, aut recta linea: in illa felicit, qua  
recta extenditur ab A, ad illud punctum  $\omega$ : quod Zenith  
vulgariter appellatur: quod & semper (ad perpendicularum)  
spectantis imminet vertici: Polusq. Horizontis a nonnullis

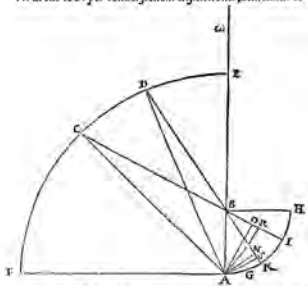
*Parallacticus Nucleus.*

li vocatur. Ad  $A$ , &  $B$ , ducatur recta  $C, A, C, B$ : &  $D, A, D, B$ . Per omnes  $C, B$ , &  $D$ , ultra  $B$ , percurrant: donec in circumferentia  $A, G, H$  aliquid incident: ubi vero incident, sint  $I, K$  puncta. Sint  $C, B$ , &  $D, K$  linee recte. Inter puncta centro  $C$ , & interualla  $C, A$  portio circuli descripta. Cuius circiferentia, occurrat  $C, B$  rectae in puncto  $R$ . Similiter centro  $D$ , & interceptae  $D, A$ , alia circuli portio descripta: cuius circiferentia, lineae  $D, B$ , obliqua sit in puncto  $S$ . Jam vero, si puncta  $A$  (per duodecimum primi Euclidis) ducantur perpendiculariter:  $A$  o super  $B$   $I$  &  $A, N$ , super  $B, K$ . Notissimum est, quod  $C, B$  est angulus maioris distantie verticalis Apparentis: &  $D, B, E$ , minoris. Similiter, quod  $E, A$  distantia est verticalis Apparentis:  $C, A$  &  $E$  maioris: &  $D, A, E$ , minoris. Chim vero illa que est  $E, A$  &  $A$  est albiditas, & verticalis, distantia, angulorum differentia, albidum dicitur diversitas: fuit (Græce nominatur)  $\text{Parallaxis}$ : canemque hic centinori confusum: in  $C$  quidem, & lineis  $A, C$ , &  $B, C$ , in puncto  $C$ , concurrunt: & in  $D$ , & lineis  $A, D$ , &  $B, D$  in puncto  $D$  se inflectunt: ubi, & horum angulorum  $\text{Parallaxides}$ , ad  $C$ , &  $D$  (tamque centra) sit constituturi, fuit arcus  $A$  &  $R$  &  $A$  angulus ad  $C$ , &  $D$ , respectucentium: Sinus rectus esse, recti sit anguli  $A, C$ , &  $A, N$ , (tum per constructionem, tum per vigesimam propositionem libri Iste Iosanni Regiomontani de Triangulis) manifestum esse: Nimirum  $A, O$ , quidē in triangulo  $C, A, O$ , rectangulum esse: ipsum  $A, C, O$ , angulus  $\text{Parallaxis}$ , sinum rectum esse: Et  $A, N$ , (in trigono rectangulo  $D, A, N$ ) ipsum angulum  $\text{Parallaxis}$  ad  $D, N$ , esse sinum rectum, &  $1$  &  $1$  igitur rationes ipsius  $A, O$  ad  $A, N$ , eandem esse, quod est sinus recti maioris ipsius Apparentis distantia verticalis (scilicet ipsi Phenomenon in  $C$  positus) ad sinum minoris distantia verticalis Apparentis: dum  $\text{Phenomenon}$  est in  $D$ . Nam et in trigono

B. III. A. B.

*Parallaticus Nucleus.*

*A B O, constare potest (per constructionem, et dictam vigesimam, Regionem) de Triangulo  $\triangle A O$ , rectam ssum rectam, esse arcum  $A$  : siue anguli  $A B O$ , cui (per 15. primi Elementorū)  $\angle$  equalis est centesimae,  $C B E$  : Apparentis nimirum materis distantia verticalis, angulus. Quare arcus illius distantia verticalis materis, similis erit arcui  $A$  : per conversionem definitionis. Similium er-*



cum. Et  $\widehat{AN}$  (simili argumento) sinum rectum esse, certum est, ipsius  $\widehat{AK}$  arcus: sine  $\widehat{ABN}$ , anguli huius contrapositione esse aequalem: nimirum  $\widehat{DBE}$ : angulum minus distantia apparentis a vertice. Quare per conversionem definitionis Similium arcuum, & illa distantia verticalis, arcum habes, similem ipsi  $\widehat{AK}$  arcui: itaque (per praemissam) quam rationem habet Sinus rectus arcus apparentis

### Parallactic Method.

parentis maioris distantia verticalis, ad finem recti fluitans, minoris verticalis distantia Apparentis: eandem habebit A<sub>1</sub> (finem recti, A<sub>1</sub> arcum) ad A<sub>2</sub> N, finem rectum, A<sub>2</sub> arcum. Sed et superius attendimus, eandem omnino lineam A<sub>1</sub> K arcus, A<sub>2</sub> finem rectum esse maioris recti Parallelae, ad C<sub>1</sub> procatum: et eandem lineam A<sub>2</sub> N, finem rectum esse, minoris recti Parallelae, ad P<sub>2</sub> procatum. Quare (per primam Propositionem, et per alteramquam quintam Propositionem) Eandem omnino lineam rectam habebit A<sub>1</sub> K arcum, A<sub>2</sub> finem rectum recti Parallelae maioris, ad finem recti recti Parallelae minoris, apertum habet finem rectum maioris distantia verticalis Apparentis, ad finem recti minoris Apparentis distantiae. Proinde, in duobus quilibet duobus, duobus, eadem sunt, similibus Phaeomorphi Parallelae (modis interea diurno Tonus folium ferre concipitur modo) eadem ratio esse recti finis maioris Parallelae, ad finem rectum minoris, et recti finis recti minoris a verticali distantia Apparentis, ad finem rectum minoris Apparentis, finem rectum.

Quod demonstrabitur et obvertitur.

**Admonitio.**

*Prædix Mathematico facillime adverte, demonstrationem nostram nihil impediri cursum: sine P<sup>h</sup>ænomæno non videtur contingi, in eodem Circulo verticali, diversi illi distantiam a vertice apparentes habere: sicut, & Sæctorum  $ACR$ , &  $ADS$ : & Sæctorum  $AB1$ , & Sæctorum  $ABE$ , in eodem contemni plano cõtingit: Sine in duobus diversi Circuli verticalibus: & Sine hæc quidem in uno plano, semper erunt: Sæctor  $ACK$ , & Sæctor  $AB1$ , & linea  $ABE$ . Sed in aliò plano, Sæctor  $ADS$ , &  $ABK$  Sæctor, & linea  $ABE$ . In quod  $ABE$ , in omnibus erit plane, per quod possumus transgredi.*

Hinc manifestum redditur: Si duarum verticalium Apparentium distantiarum alicuius Phænomeni

*Parallaticus Nucleus.*

(ita, vt suppositum, delati) cognoscantur arcus, & finium rationem quoq; rectorum inter se, ipsarum Parallaxium, in illis diuersis distantijs proueniunt, unâ fieri cognitam.

Erit enim eadem ( per præmissam ) quæ est finium illorum rectorum, qui sunt ipsarum distantiarum Apparentium propriæ.

*Porisma. 2.*

Clarum etiam hinc fit. Si binæ supradictæ Parallaxes componantur, denturq; tanquam vna: cognitis tamen Apparentium distantiarum arcibus (singulis Parallaxibus seorsim debitis) facillimè ipsas particulares disjungi posse Parallaxes.

Hoc autem demonstrari potest, auxiliante Ptolemai  
Lemmaio secundo: quod in eiusdem Epitome, Purbachius  
& Regiomontanus in duodecimam primi libri propo-  
sitionem intraduxerunt. Quam etiam, Regiomontanus, in suo  
de Triangulo libro quarto, hisce habet verbis.

## Propos. xxi.

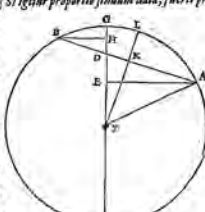
Si quis arcus notus, minor semicircumferentia, in duos diuidatur, quorum finus proportionem habeant datam, vterque eorum notus erit.

Sed, ne, vel Typographi negligentia, vel Antographi nonnulli  
abfcedi, innotata re editio, aliquando studioſius parere poſſit moleſti-  
am: idem ipſa vigeſimum primum, & vigeſimum ſecundâ Pro-  
poſitione Regimentarii (propter hæc neſtra) intelligere vel  
exerere vident, rem illa me ætatem ſuillarum exiſtimant, ſi  
debito nititur, & iuxta ipſius Authoris inſtitutum, eaſdem hic  
ſubſequere non vacitat.

Sit arcus  $AGB$  datus, minor semicircumferentia<sup>1</sup> di-  
visus

*Parallaticus Nucleus.*

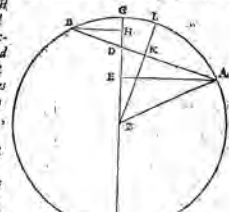
nisi in duae arcus A G, & B. Sicut, proportio sinu arcus  
A G, ad sinum arcus B, data. Dico quod inter, arcuum  
parvum A G, & B, data habet. Subtendit enim  
parvum A G B, Chorda sua, A B. Ducatur, per punctum G,  
& centrum circuli, Z, diameter circuli, & secus Chordam  
A B, in puncto D. Ex punctis autem A, & B (arcum A B  
terminantibus) duae rectae descendunt, perpendiculariter ad  
diametrum: quae sint E D & F R. Quia utriusque, con-  
stat esse sinum rectum arcus sui contenti minoris. A E qui-  
dem, arcus A G, & B H, arcus B G. Educatur etiam se-  
cundum diametrum Z L: orthogonaliter secus chordam A B in  
puncto L. Quia, in omni circulo, sinus datae, sunt rectae



$\frac{C}{G}$  &  $\frac{D}{H}$ , ar-  
runtum A G, et  
G B, nota: s ....  
ex 14. primi  
huius. ¶ Si vero proportio ditorum finium, non fuerit  
proportio equalitatis, erit alter eorum, alter maior. Sit  
itaque A E, maiorem B H: unde & arcus A G, maior  
C.g. erit

*Parallaticus Nucleus.*

erit arcus  $G B$ . Cum autem, propter  $A E$  ad  $B H$ , sit nota,  
 oportet rem in terminis notis reperiri: per definitionem  
 proportionis datae. Et ideo, per quintam primi huius, in  
 numeris notis: qui sunt,  $R$ , &  $S$ . R quidem maior, &  $S$ ,  
 minor. Ita, ut sit proportio finis  $A E$ , ad finem  $B H$ , sicut  
 $R$  ad  $S$ . Cum autem duo trianguli  $A E D$ , &  $B H$  rectan-  
 guli, duo angulos apud contrapostos, & (per 3. primi E-  
 lementorum) duos reliquos habeant aequales, erunt ipso-  
 rum trianguli. Et ideo, per sextam, proportio  $A E$  ad  $B H$ , si-  
 cut  $A D$  ad  $D B$ . Propterea autem  $A E$ , ad  $B H$ , erat tan-  
 quam numeri  $R$ , ad numerum  $S$ : quare & proportio  $A D$ ,





*Parallaticus Nucleus.*

[illegible]

*Parallaticus Nucleus.*

portione sinuum suorum, utque eorum cogni-  
 tus habebitur.

Duxit autem  $AG$ , &  $GB$ , terminis illis intelligen-  
 tur: minor, quia  $GB$  pars maiori,  $AG$ . Quia differ-  
 rentia sit data: arcus videlicet  $B$ . Eorumque sinu, ha-  
 bentur datam proportionem. Dico quod uterque eorum natu-  
 redictus. Incedat enim per  $G$ , terminum communem ar-  
 cuum dictorum, & centrum circuli, & linea recta cingens  
 arcum dictum: & diametrum tamen circuli  $GT$ , completens  
 Educaturque semidiameter  $ZM$ : faciat chordam  $AB$ , et  
 orthogonales in puncto  $L$ . A punctis  $A$  &  $B$  (chordae  $AB$   
 terminantibus) ducet perpendicularis  $AD$ , &  $BE$  ad  
 terminum descendunt. Quas constat esse duas sinu arcus  
 $AG$ , &  $GB$ . Si itaque ipsi fuerint aequales: hoc est, pro-  
 portio sinuum data, fuerit proportio aequalitas: erit, per  
 communem  
 scientiam,  
 arcus  $AG$ ,  
 &  $GB$ ,  
 aequalis  
 arcui  $AT$ .  
 Demp-  
 tior igitur  $A-B$   
 (nota  
 per hypo-  
 thesim) ex  
 semicir-  
 culi  
 ferentia nota: residui medietas, arcus scilicet  $BG$ , minor  
 cognitus erit. Cui si arcum  $A$ , notum, addideris: prodit  
 totus arcus  $A$ , minor, cognitus. ¶ Si vero alter sinuum  
 maior relictus extiterit: sit (verbi gratia) arcus maioris  
 $A$ , & sinu, maior sinu arcus minoris,  $B$ , & abscondatur  
 ex sinu  $A$ , linea recta  $KD$ , equalis ipsi  $BE$ . Duxit line-  
 am  $AK$ , &

*Parallacticus Nucleus:*

*ianctim*, A ad B, et sic finit differentia numerorum R & S / videlicet X, ad ipsum minuet numerum S. Cumq; tres harum quantitates proportionalium sint datæ, nimirum numeri N & numerus S : & Chorda A.B. quam arcus sunt significat per Tabula finem, aut Chordas. Duplicationem enim finis recte mediocritati ipsius arcus, productivæ totæ Chordæ integræ arci, & triæ quarta proportionalis, scilicet

X .....  
Y .....  
Z .....

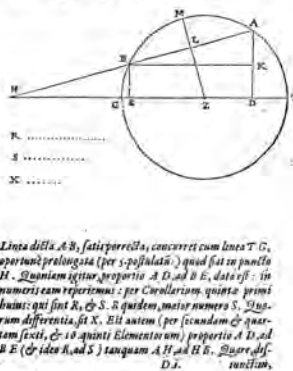
cet linea B.H. nota : per se primi loci. Si idcirco ista A.H. cognita fuerit. Item B.D. medietatis linea. A.B. notæ, non erit incognita. Unde & linea II.E. dabo reperitur. Atque iterum sub A.B. & II.R. continetur Parallelogrammum rectangulum (per se prædicti huius) notum etiam III.C. quod æquatur ei quod sub A.T. & II.G. : per se prædicti. Et primum communem horum sententiarum. Quoniam quod sub A.T. & II.G. continetur, notum est. Cum se quadratus similia-

*Parallaticus Nucleus.*

[illegible]

### Paralyticus Nucleus.

B K : qua per 3 primi Elementorum, a quidlibet linea  
E D, unde ex per 3 primi Elementorum angulus E B K,  
rectus habebitur : angulus E D K, rectus exillente. Pro-  
inde angulus A B E, rectus superabit, erit obtusus. Pro-  
ducta autem linea a d, per B, indequoniam ex parte puncti B  
E : erit reliquus angulus apud B, acutus : ex altera parte  
linea B E, constituitur. Cumq[ue] fit angulus B E G, rectus.



*Linea dicta A B, satis perrecta, cunctisq; cum linea T G,  
operanti prolongata (per s-poliatam) quod sita panfita  
M. Quoniam igitur proportio A D ad B, date est;  
numeri eam repetimus: per Corollarium quinta primi  
huius qui sint A, & S. si quidem minor numero S. Qua-  
rum differentia, fit X. Est autem (per secundam & qua-  
rtam sexti, & 10 quinti Elementorum) proportio A D ad  
B E (& ides A ad S) tanquam A H ad H G. Quare dicitur*

*Parallaticus Nucleus.*

vel quacunq; alia, data Parallaxi, cum Apparente  
distantia verticali, eiusdem Parallaxeos propria:  
non cognita quidem, Phaenomeni à terra distan-  
tia.

## Appendix. 1.

Hinc Peurbachij votis satisfacere possumus: qui. 30.  
minutorū Chordarū, veraciter non haberi, que-  
rebatur, in fine libelli sui, de Sinubus & Chordis.  
Que (inquit ille) si haberetur, omnes Chordas,  
arcuum aliorū, veraciter essent notæ,

*Appendix. 2.*

Similiter, ex proprietatibus huius sic (in Triangulis ACB, ADB, ABO, ABN, & alijs Schematicis) demonstratis: qualia inferri, demonstranturque alia possint, tum Theorematum, tum Problematum (ad nostrum institutum necessaria) futuri explicabimus, in eo, quod (Deo fauente) de Phenomeno isto mirabili edere statimus labor.

Sui autem istæ Regiamontani Operationes, aliqui, vel pra-  
terea, vel diffidit, (alijque prout) videri possunt: præter  
intenti, (spem, intentum, per) facili, valde, atque facili  
prebent. Quoniam si sit autem (certitudo studij) nam  
v. frequentior, facilliora omnia (Causa efficienda) ridet  
præter. At si magna in his, simul, necesse, necesse  
Compendia: Studij, communicare decernunt. Et certe  
alij, namque occupant, quare et accurate, quare vult  
calida: horum in omni, iustitia, aliquam exstinguere  
extinguant, in vult diffusi Theoremata admodum, a meo  
extinguat Parallelum.

*Parallaticus Nucleus.*

[illegible]

*Porisma.* 3.

Si duarum prædictarum Parallaxium differentia sol-  
luta sit data, cognitaue, & duarum distantiarum a  
vertice Apparentium arcus, etiam cogniti: Paral-  
laxes hic singulas posse exhiberi integras, distinc-  
tasque, illarum distantiarum proprias, satis est ma-  
nifestum.

**Keywords:** child sexual abuse; disclosure; self-blame; victim blaming

*Propof. xxij.*  
Si data fuerit differentia duorum arcuum cum pro-  
C. illi. portione

*Parallaticus Nucleus.*

aggregat, radicumque cili quadratum. Dicitur quod [quod]  
formatum sit, idemque per [per] sumum totum multiplicat; per  
duodecim dicitur radicum sum ciliatum: ad exco[m]muni-  
cationem, dimidiatum artem dicitur m[u]ltiplicat; et reliquum  
etiam exco[m]muniat. Quod si per [per] sumum totum multiplicat  
etiam artem quatuor numeris. *Ex. In exemplo.* Per  
tertiorem propriam finem artem AG, ad finem artem B, G, fi-  
nem ad I, flegit A, differentia artem AG, G, B, et B  
ad gradum. Nam differetia AB, et 21624. Differetia G, B  
ad C, et B, 7. Multiplicat differetiam AB, et 21624. Per  
tertiorem 75546, quod dicitur per 7, exco[m]muniat 26221. Per  
filiem B, M, itate addit medietatem Chorda A, et filie  
[B] L, 21030, refellunt 26221. Item filie L, M, et filie  
[B] L, 21030, refellunt 26221. Item differetia 21724  
et 26221, quod multiplicat per 7, exco[m]muniat 1724  
182746212, quod addit quadratum [B] L, 21030. Item  
sum quod est 38388000, reliquum 1232500222.  
Huius radice quadrat, et 112923, per 10548 B, 21030  
quatuor facit. Dicitur quadrat [B] L, 21030, per 2034  
per 2034 et 21030, quod multiplicat per 7, exco[m]muniat 150  
exco[m]muniat 150, item filie artem AG, G, B, per 21  
sumum. Item [in]cassum T habet artem quadratum 150, [per]  
primam artem, et item artem artem artem B, M, 22, gradum  
medietatem artem B, G, per 21 facit. Item addit M, G, per  
21 facit. Item artem artem artem artem artem artem artem  
quatuor 7 per 21, et totum computat artem artem artem  
Vim, item artem artem artem artem artem artem artem artem  
artem artem artem artem artem artem artem artem artem

*Parima*. 4.

Manifestum etiam ex istis est, Parallaxium Canonem  
facillimè componi, vel a magnis quibusdam Ma-  
thematicis compositos, corrigi posse admodum

*Parallaticus Nucleus.*

Admonitio.

*Caveant autem omnes qui vel ambitionis ardore perciti : vel insensiti securitate animati , non solum artificose iniquitatem , prudenterq; examinata , sua audeant , in doctorum hominum oculis , auribusq; ponere.*

Epilogus.

[illegible]

Valcathe interim, Amici me

JO. DILL, LOND.

*A Certain Essence of Parallax*

1573

*Cover  
translation  
and synopsis  
of text*

A Certain Essence of  
**PARALLAX**  
Commentary and Practical Application

*Written by John Dee  
London*



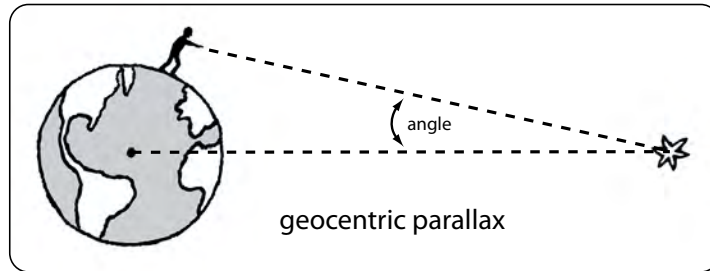
**LONDON**  
*Printed by John Day  
In the Year 1573*



### ***Definition of parallax***

**Parallax** is the angle between the lines that join a heavenly body to two different points of observation.

**Geocentric parallax** is the angle between the line joining **one's location and a heavenly body** and the line joining **the center of the earth and that heavenly body**.



### ***Synopsis of: A Certain Essence of Parallax***

Dee's work on the mathematics of parallax was often put in a single binding with the work of Thomas Digges's entitled *Alae seu scaleae mathematicae*, meaning "Mathematical Wings or Scales" (how he graphically visualized his trigonometric theorems).

The famous mathematician Leonard Digges (1520-1559) died when Thomas (1546-1595) was only 14, and Dee had become Thomas' "mathematical father."

Both Dee and Thomas Digges were inspired to write about Parallax when a "new star" (or supernova) appeared in the sky in 1572. But Robert Goulding and Stephen Johnston assert that these two friends had different motives for writing about parallax.

Digges was a Copernicus enthusiast and wanted to use his mathematical findings to promote Copernicus' heliocentric ideas.

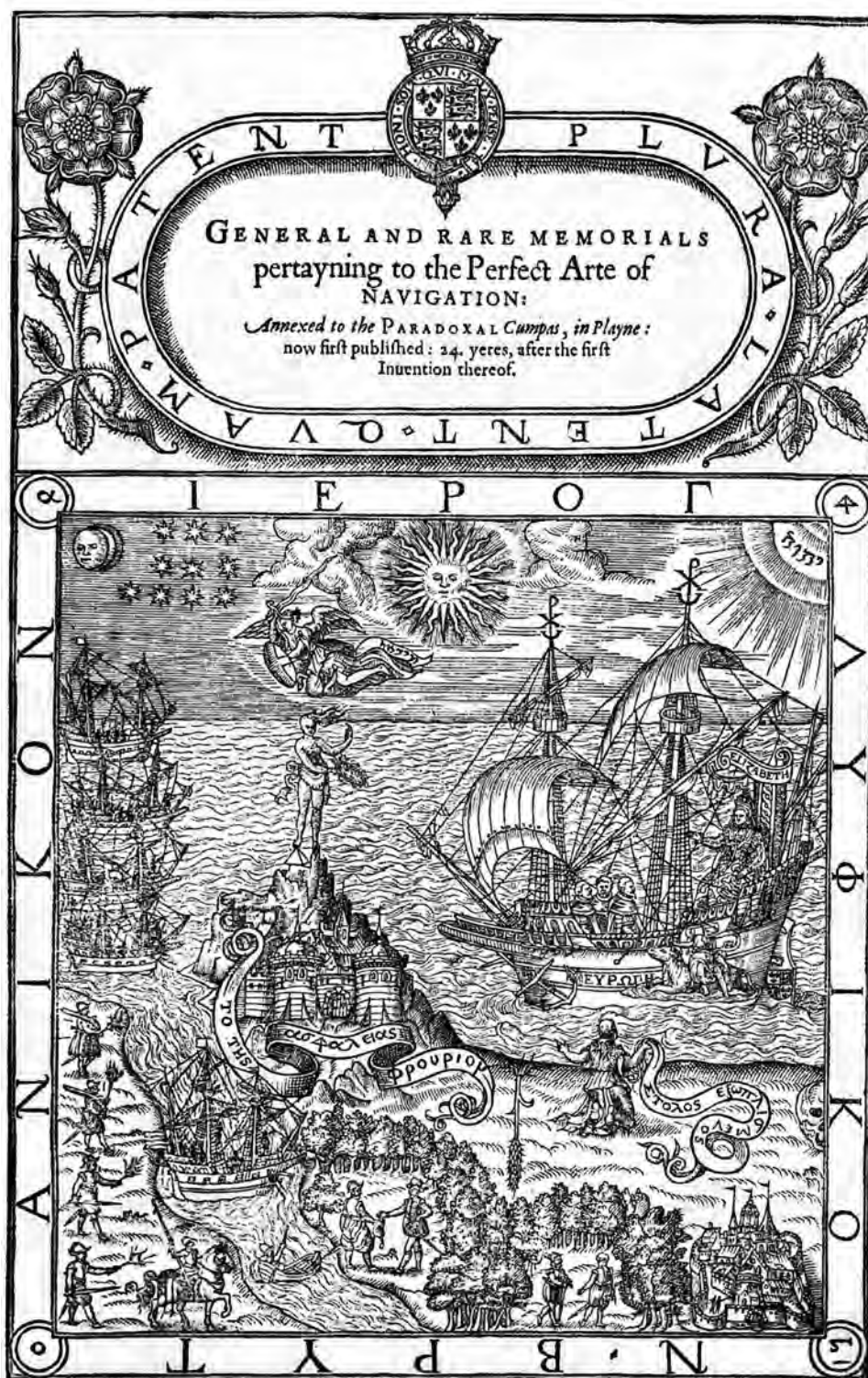
Dee steered clear of the controversial Copernican theories and emphasized how understanding of parallax was important in the astronomy involved in astrology.

[Robert Goulding, *Wings (or Stairs) to the Heavens, The Parallactic Treatises of John Dee and Thomas Digges*.  
Stephen Johnston, *Like Father, Like Son?*  
*John Dee, Thomas Digges And the Identity of the Mathematician*  
In  
*John Dee: Interdisciplinary Studies in English Renaissance Thought*,  
edited by Stephen Clucas, pp. 41-84]

*General and Rare Memorials  
pertaining to the Perfect Art of Navigation*

1577

*Original in  
Elizabethan  
English  
(modern-  
ization not  
provided)*





# A necessary Aduertisement,

by an vnkown freend, giuen to the modeſt,  
and godly Readers: who alſo carefully deſire  
the proſperous State of the Common wealth,  
of this BRITISH KINGDOM, and  
the Politicall S C R I P T I S  
thereof.



**L**amentable and irkeſome, 1.  
are theſe our dreary dayes:  
(my welbeloued Cuntriman)  
Seeing the conditions  
of to to many, are be-  
come ſuch, as, to be to  
curious of other \* Mens  
dooings: As though, they  
them ſelues, were ſuperha-

bundantly perfect: or dwelt in Security, of not be-  
yng at any tyme, hereafter, either ſurueyed, or con-  
trolled for their own.

Nay, ſeeing the ſubtilty and impudency of ſome, 2.  
is ſuch, that they can, and dare, cunningly and cra-  
tily, conuey to them ſelues (or, to whom they liſt)  
the Title and Interest of the thanks and commen-  
dation, due to other Men: who are not of ſo braſen  
viſages, as to practiſe ſuch ambitiousatches for them  
ſelues, or to procure ſuch malicious Diſgraces, to o-  
ther: But are of that myldenes of Spirite, as, P A-  
TIENTLY TO ATTEND THE END,  
which ſhall reueale the V E R I T Y: when, iuſt  
gwerdon, ſhall to euery Man be diſtributed, ac-  
cordingly.

And thirdly, Seeing, ſome are ſo doggedly vio- 3.  
lent, and vayngloriouſly doting, that they can not  
Δ. ij. like,

TO THE RIGHT WORSHIPFUL M. CHRISTOPHER  
Hatton, Elquyer, Capitayn of her Maieſties  
Garde, and Gentleman of her Priny Chamber.

**Y**F Priuat wealth, be leef and deere,  
To any VVight, of Brytiſh Soyl:  
Ought Publik Weale, haue any peere?  
To that, is due, all Wealth and Toyl.

*\* Annot.  
1576.* Whereof, ſuch Lore as I (of \* late,)  
Haue lernd, and for Security,  
By Godly means, to Garde this State,  
To you I ſend, now, carefully.

Unto the Gardians, moſt wiſe,  
And Sacred Senat, or Chief Powr,  
I durſt not offer this Aduiſe,  
(So homely writ,) for fear of Lowr.

But, at your will, and diſcreet choyce,  
To keep by you, or to imparte,  
I leaue this zealous Publik voyce:  
You will accept ſo ſimple parte.

M Inſtrictors freend did warrant me,  
You would ſo do, as he did biſ:  
That \* Redy freend, can witnes be,  
For Higher States, what written is:

Of Gratefulnes, due Argument.  
If greuous wound, of ſklandrous Darte,  
At length to cure, they will be bent,  
M Inſtrictor, then, will doo his parte,  
In neeſt wiſe, I know right well:  
No Merit ſhall forgotten ly.  
Thus much, I thought, was good to tell:  
God graunt you Blis, aboue the Sky.

Dee's wordplay  
on his friend's name.  
Sir Edward Dyer

*\* E. D.  
1576.*

temq; Publicam procurandam, ac promouendam,  
expeditiſimè & potentiſimè. VVbi, God graunt,  
Amen.

Trinitas { Homo Dei — Nſq; — Menſ }  
Humana { Anima Media — Δictona — Diuina } HOMO { Philoſophia — The Inſtructor. }  
{ Homo Animalis — Diſcreta — } { Mechanica — } { The Mechanick of }  
{ Homo — } { Philoſophia — } { the State Politicall. }  
{ Homo — } { Philoſophia — } { Theologos — }  
{ Homo — } { Philoſophia — } { Theologos — }  
{ Homo — } { Philoſophia — } { Theologos — }

The Epistle in Meter, (annexed in the end of this  
Book,) was by the Mechanicien ſent, after that the  
vnknown Freend had (at his own charges, and with  
his careful Trauail concurrent,) put the foreſayd two  
Treatiſes, in Print: & deliuered again into the hands  
of the ſayd Mechanicien, the whole Impreſſion thereof.  
The diuers Intents and purpoſes of which Epistle,  
are eaſily to be perceiued. Therefore, yf  
to haue ſayd thus much, was  
neceſſary, the ſame alſo  
may ſuffice.



TO THE RIGHT WOR-  
shipfull, diſcrete, and ſingular fauorer, of all  
good Artes, and Sciences, M. Christopher Hatton  
Elquier: Capitayn of her Maieſties Garde, and  
Gentleman of her priny Chamber.



**N**O onely my dutifull good will toward your  
Worſhip, and my great deſire, to doo ſome  
thing beneficiall to this my Native Cuntry: But  
alſo, a certain ſtinging Indignation, agaynſt  
the Impudent Attempt of ſuch, as yſe, wrong-  
fully to challenge to them ſelues, other mens  
Trauailles, (and nor hable to yeld any Ingeni-  
ous Invention of their own) haue, at this \* pre-  
ſent, forced me, to doo my Inducor, for the  
publishing of this ſtrange Inſtrument, with the  
name of the true Inuencor thereof, annexed:

And humbly to dedicate my ſimple Induſtry herein, to your worſhips pro-  
tection, Truſtyng you will the rather accept the ſame, beyng (as it were)  
a Crum, to my great Contentation, ſaln from his plentifull Table, whom  
(I am aſſured) you doo deſerue and ſincerely, both loue and eſteeme: as  
well, of your own moſt curteous diſpoſition toward all men, with whom  
your worſhip hath to doo: as alſo, for ſundry his vertues, and excellent  
Skill, in many Artes, and Sciences, Wherewith the higheſt hath very  
graciouſly bleſſed him. For which his habilitie, and Talent, he is all  
wayes moſt humbly thankfull, to the onely Author, and giuer, of all  
goodnes and wiſedome. Verely, for theſe 24. yerres (at the leaſt) I  
haue had the Gentleman in great admiration: As well for his foreſayd  
excellencie in good learning (ſo iudged of, long ſins, by the learned, in  
ſundry Nations) As, for his moſt ready Cartelle in Communicating, or  
conſerring to and with ſuch, as duly require his Aduiſe, Opinion, or  
Iudgement, in any Science, Arte, or Practiſe; wherein he hath had  
any ſpeculation or exerciſe. Such Commendations, as theſe, although  
they be great, (and rare, in any ſtudious Gentleman of this Kingdom,  
els;) Yet, neither the ſame, nor ten tymes as great (ſounding lowd  
about his eares, for theſe many yerres paſt) haue at any tyme, or yet  
doo, any one pmys point, put vp his hart, vayngloriouſly: but haue,  
and doo make him more loyally thankfull, to the kingly and free giuer,  
of ſuch his great Talent: So great, as *Regulus Rei nota ſunt, & qui illi  
bene uolunt, exiſtimant orationem non eſſe parum Magnitudinis Rerum geſta-  
rum*, (As that prudent Athenienſien Gouernor, Pericles, ſayd, In  
oratione Funebris: Commending them; that manfully had ſpent their  
liues, in the late warres, then: ) *Ally, ignari, iudicant laudes eſſe im-  
modicas: quia immoderati excellenti virtuti. Laudes enim ea viſq; tolerabiles ſunt,*  
*donec ea diſſimulant, quia Auditori ſe quos, facere poſſe arbitrantur: Si Maiores  
dicuntur, Inuidet, non credunt.*

Therefore, pardon me (I beſeech your worſhip) Yf in rehearſing  
here, and there (glauſing) ſome points of his due Commendation,  
A. i. I ſpeak

*\* An. 1576.  
Auguſt. 1.*



















CALENDAR TREATISE,  
WRITTEN AT THE REQUEST OF QUEEN ELIZABETH  
AND THE PRIVY COUNCIL.  
HAND WRITTEN BY JOHN DEE.

(Courtesy of the Bodleian Library, University of Oxford  
MS Ashmole 1789 fol. 1r)



(2)

\* As may be seen  
understand by the  
the Circle A B  
A. B. C. D.

2. Noted how by the  
2nd Circle A B  
B. C.

3. The word Sun is  
required for the  
point at the North  
and the South being  
the North and S.  
4. And they are  
noted at the North  
S. and T. +

5. Designed at the  
two Circles A. B.

1. The Sun's path in the heaven is called the *Ecliptick* line (and very  
antiently) the *Pythias* line: By this it is denoted, in respect  
of an other great Circumferential line in the said heaven circle,  
which is called the *Equinoctial* line, and sometimes the *Axi-  
tor* (in Latin) or *Equinoxialis*: Because, as that *Equinoctial*  
Line is in the very Middle Circumference between the two known  
Poles of the World (or of the most temperate and Uninhabitable day,  
Midstion of the heaven, when the Sun is due to the middle of  
the sign Circle (or the *Ecliptick* circle) in the annual  
distance from the known Poles of the World (A. and now about  
23 degrees and 28 minutes) and therefore the Sun's Circle  
or *Ecliptick* must be *By-pass* to the *Equinoctial*  
Circumference: and they must cross or cut, each other  
in two places, or points opposite. Which opposite places  
(or Mathematical points) we term the *Equinoctial* points  
or *Solstis*. Breach throughout all the World, where the Sun  
rises and sets within 24 hours, and a very conspicuous  
when the Sun his place is in either of the said two Points.

1. Days and night are  
equal: that is the Sun  
is long under the Ho-  
rizon of every such  
place: as has been  
in the space of that  
whole Day, under the  
Sun to come to either  
of these *Equinoctial*  
Points: no more, being  
able to find the *Equinox*.  
And as these two great Circles cut each other in two places, so do  
they part or seem to (can each from other on both sides these  
*Equinoctial* Points. (On the North side J

mean,

mean, and on the South Side;) and the greatest distance  
of these two Torculars from each other is called the Arke  
of the Sun his greatest Declination; which arke is  
South 23 1/2 and in Common. Astronomical people,  
(by good reason) do say for the Sun circle, (or the Ecliptick  
(circle) from the Equinoctial, is the Equinoctial, and  
the Equinoctial, distinct from the Ecliptick; the  
Points or places of the Ecliptick, are not indistinct from the  
Equinoctial, are called the Tropick or turning places.  
Because when the Sun hath dignified (as it were) from the  
Equinoctial, so far as it can, to the farthest Summer Point,  
then it doth begin to turn again, towards the said Equinoctial,  
as first in his own Sphere, and so forth, it goeth always forward  
in a perfect Torcular Torquing Circle. And of these two  
Equinoctial Points, that which the Sun entrencheth  
in March, is called (with us in our Climate) The Spring  
Equinox, or Equinoctium Vernal, or Veru  
punctum, Equinoctiale, or the beginning of the Sign,  
in Decaletemorium of Anni. And that other Opposite  
unto it, is called Equinoctium Autumnale, or Autumn  
Punt, likewise. Each of the two Tropick Points is called  
Solstitium, that is the Sun stay; (his declination  
Exceeding 90 Degrees) And that point we call Solstitium  
Estivale, or Solstitiale undum Estivale  
or Tropicum Punctum Canceri &c. and that other  
Solstitium, Hiemale, or Tropicum punctum  
Capricorni. This Summer Sunstay point next us  
we term also Junitum (Canceri &c.) into which  
the Sun entrench in June: And that Winter Sunstay  
point, we call the beginning of Capricorne  
unto which the Sun entrench in December. These  
things being somewhat hard, remembred or notified  
for propriety sake, to such as are not well acquainted  
with such terms, and so declaration may be made of the equi

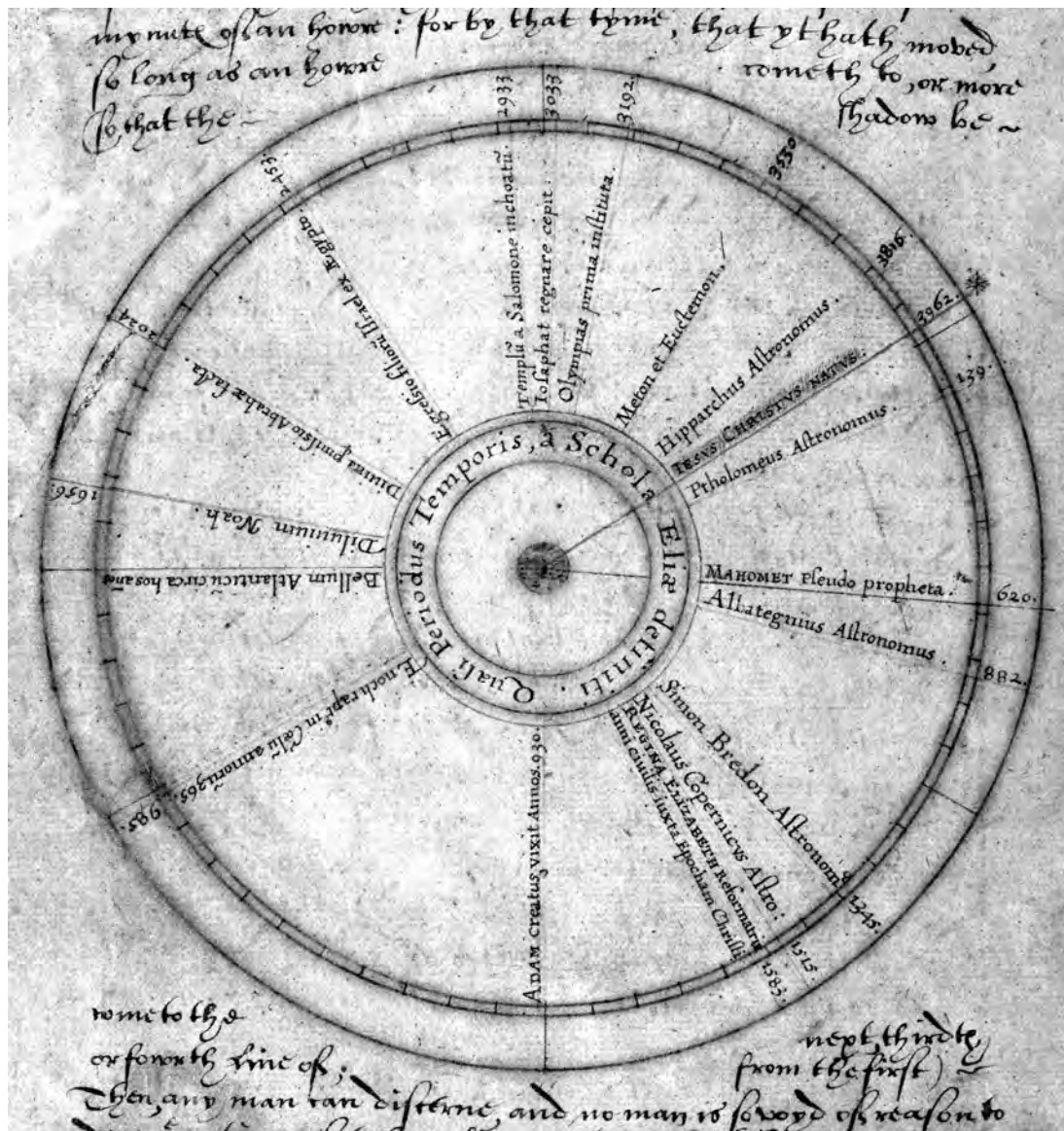
(7.)

in hand; which is the Sun's Revolution, at our first year according to the true and Natural year) after this manner it may begin... Of the two sorts of years (now compared) the one is called his Latin revolution, ANNUUS, or SOLARIS ANNUS; VERTENS, or ANNUUS PROPRIUS, the other ANNUS CIVILIS, or ANNUUS JULIANUS. ANNUUS PLURIS (of that sort) which is chiefly Civilis, now may thus be described. A Solar year is that Periodicall space of time, which is accounted spent in the Sun's motion along the Ecclesiastick Spherer, that Moment of time, where in the SUN begins to have place in any prick or point of the 360 Degrees of the Ecclesiastick Line, and that other moment of time, wherein it is returned, come again unto the first prick or point from which his said Motion is so considered; which is the prick & end of the foresaid Equinoctiall or Tropicke pricks, or any other one prick, above and the same distance, accounting from any of the former four principal pricks or points. This Space, commonly called ANNUUS JULIANUS, is named for that JULIUS CAESAR did first so order his first year, and by quality thereof established it may thus be declared; what we understand it to be. A first or vulgar year is the space of 365. Night days, and six small hours. Night days I call them, imitating the Greek Apt-nan, Nyctemera, or Nycthemera; because it containeth joyfully the times of both the dark and the light being about 24. small hours, whereas at the creation in which was made Faction EST CREPUSCULUM, MANE DIES VIGILAE, and even then its voice since hath been said That light had the Name of Dies also: by God his own appearing, as MOSES by the Lord his own words taught to record, Appellavitque Lucem Diem, et tenebras Noctem. Now you see by the way how unprofitably this double manner of terming Day is grounded, and yet two dark notes of Right retained; and yet two dark notes at the creation









reproduction of Dee's original Dial of Time

(Courtesy of the Bodleian Library, University of Oxford  
MS Ashmole 1789 fol. 11r)

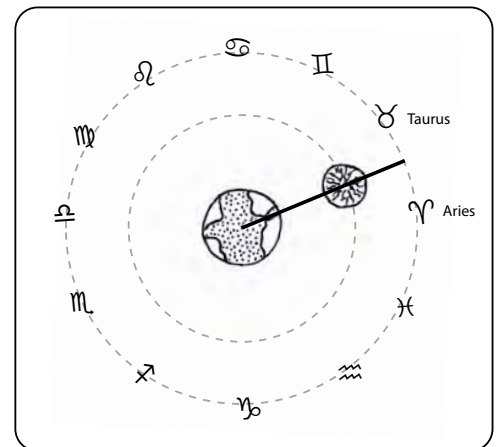
**A Plain Discourse and** humble advice for Our Gracious Queen Elizabeth, her most Excellent Majesty, to praise and consider the needful reformation of the Vulgar Calendar of Civil Years to reconcile the Days in accordance with the time which has truly been spent.

**In the Method** of this present consideration of time, the true place of any planet or other Star is determined by a straight line Imagined to pass from the Center of the Earth through the Center of the body of the planet or other Star, up unto the first and highest heavenly Convex Superfice [surface].

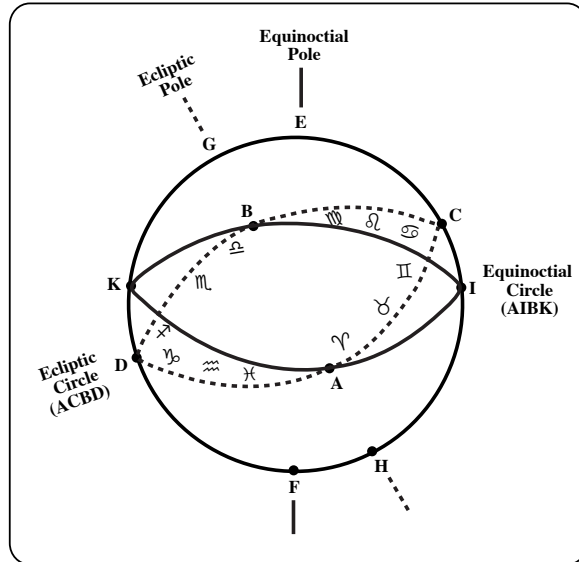
And wherever the upper End and Mathematical point of that imagined line is, there the true place of the Star or planet is esteemed and reckoned to be.

As any Planet or other Star moves either forward, backward or sideward, so continuously the upper End of said line determines the true place of that planet or Star.

The Sun has such pre-eminence that the Uniform and constant trace of the continual course of its line in the heaven is the Principal circular circumference to which the motions of all the other Planets and Stars are compared (their distance away from the Sun's course in latitude).







\* As may here be understood by the circle noted by the letters A, B, C, and D.

△ Noted here by the Red Circle A I B K

\* The north Pole is signified here by the prick at the letter E and the south Pole by the Prick at F.

⋈ And they are noted by the letters G and H.

▽ Designated by the two letters A and B.

That imagined Circumferential trace of the Sun's way in the heaven is called the Ecliptic \*, which very anciently has been called the Bias line. This Bias line is considered in respect to another great circumferential line in the heaven called the Equinoctial line or sometimes the Aequator (in Latin) or Equicalis △.

The Aequinoctial line is the very Middle circumference between the two known Poles of the World \* (or of the most Uniform and Unalterable daily Motion of the heaven westward). But the Poles of the one other motion of the Sun's Circle (besides the Ecliptic circle) are somewhat distant from the known Poles of the World.

The Poles of this other due Motion (besides the Sun's Circle or Ecliptic circle) are somewhat distant ⋈ from the known Poles of the World, presently by about 23 degrees and 28 minutes.

Thus the Sun's circle or Ecliptic is Biased to the Equinoctial Circumference, and they cross or cut each other in two places (or opposite points). These opposite places (or Mathematical points) we call the Equinoctial pricks or Points ▽.

Throughout the world, the Sun rises and sets in 24 hours (and a few minutes more). When the sun is at those two said Points, Days and nights are Equal. The Sun is under the Horizon for as long as it is above the Horizon (over the course of a whole Day). When the Sun comes to either of these Equinoctial Points there is no difference between the lengths of Day and Night.

Just as these two great circles cut each other in two places, so also do they part or run from each other on both sides of these Equinoctial Points. (I mean on the North Side and on the South Side.)

The greatest distances that these two circumferences are from each other is called the greatest Declination  $\Delta$  of the Arc of the Sun (either northerly or southerly).

$\Delta$  This is shown  
as Arc CI  
or Arc KD

In Common Astronomical speech (and for good reason), we say the Sun's circle (or the Ecliptic Circle) declines and is Biased from the Equinoctial. (We don't say the Equinoctial declines from the Ecliptic.) The Pricks or places of the Ecliptic that are most distant from the Equinoctial are called the Tropic or Turning  $\sqcap$  pricks.

[in Greek, *trope* means turning]

$\sqcap$  Noted by the  
Letters  
C and D.

When the Sun has digressed (as it were) from the Equinoctial as far as it can to these uttermost Points, it seems to turn again toward the Equinoctial. (The Sun goes so in his own course and circle, and it always moves forward in a perfectly circular circumference.)

$\ddot{::}$  Noted by  
the letter A

Of those two Equinoctial points, the one the Sun approaches in March is called (in our Region) the Spring  $\ddot{::}$  Equinox or the Vernal Equinox or Vernu  $\ast$  Punctum Aequinoctiale or the beginning of the Sign or Dodecatemorium of Aries.

$\ast$  From which  
prick begins  
continually the  
division of  
the Ecliptic into  
Equal parts called  
degrees of which  
30 make  
a sign or  
a Dodecatemorium.

The point which is opposite to it is called the Autumnal Equinox or the beginning of  $\square$  Libra  $\equiv$ .

$\square$  Noted by  
the letter B.

Each of the two Tropic Pricks are also called Solstices, which means "the Sun's stay." (the declination increases no longer.)

One we call the Solstium Aestivale or Solstiale Punctum Aestivale  $\Delta$  or Tropicum Punctum Cancrī  $\curvearrowright$  [the sun reaches the Tropic of Cancer].

$\Delta$  To be understood  
by the letter C.

The other we call the Solstitium Hiemale or Tropicum Punctum Capricorni  $\mathbf{Z}$  [the sun reaches the Tropic of Capricorn]

$\mathbf{Z}$  Understood  
by the letter D

This Summer Sunstay prick, which the Sun enters in June, we also call Initium Cancrī  $\curvearrowright$ .

The Wintery Sunstay point, which the Sun enters in December, we call the beginning of Capricorn.

Those who are not well-acquainted with these terms should remember or make note of them. These speculations are the reason for the matter at hand:

**The due Reformation of our Circle year  
according to the true and Natural year.**


Thus we may begin.

There are two sorts of years to be considered here. One is the **Annus Solaris** or Annus Vertens [in Latin, *verto* means to turn] Annus Tropicus. The other is called the **Annus Civilis** or Annus Julianus.


We will start with a description of the **Annus Solaris**.

  
A Sun Year



A Sun Year  is that Periodical space of time which is spent in the Sun's motion along the Ecliptic between that Moment of time when the Sun is deemed to have a place in any prick or point of the 360 degrees of the Ecliptic line and that other Moment in time when it is reckoned to come again to the first prick or point. (These pricks can be either the Equinoctial or Tropical pricks or a prick at any given distance from the four principal pricks.)

The **Annus Civilis** is also called Annus Julianus because Julius Caesar was the first to order the civil year and establish it by public edict. Here is its definition:

A circle or Vulgar year is the space of 365 Nightdays and six usual hours. I call them Nightdays imitating the apt Greek name *Nycthemere*  or *Nycthemeros* [*Nyct* means "night" and *meros* means "day"]

Jointly between both the time of the Dark and the time of the Light is about 24 usual hours. Mention is made of this at the Creation: *Est Vespere et Mane Dies Unus*. [And there was evening, and there was morning, the first day. Genesis 1:5]

Every since Creation, that Light has been given the name of *Dies* [Day] by God's own appointing, as Moses was taught to Record by the Holy Ghost. *Appellavit Lucem Diem, et Tenebros Noctem* [Call the Light Day and the Dark Night].

Thus you see (in this way), how this double Manner of terming Day is anciently grounded. But only one manner of Night is Ordained. At the Creation, there were not two darknesses noted.





The pre-eminence or priority in time assigned to the darkness or evening time is called Night.

Likewise, the morning celebrated that which was called Day.

Thus, *Vespere and Mane* made *Dies Unus*.


["Evening and Morning" made "One Day"]

And one Nightday  (the Nycthemere or Nycthemeros) is comprised of this dark Night and the light Day .

Thus, it must be admitted that these names are not of our Novelty.

**Julius Caesar**, with the help of the Mathematician **Sosigenes**, commanded and established the Quantity of the Civil year to be 365 days and 6 hours.

They verily thought that this Quantity of time answered to the true and heavenly year of the Sun's course (not a minute more or less). So, they made an adjustment to account for those odd six hours.

In our Civil Acts and Affairs these odd hours can not be utterly neglected, or unreckoned or not considered). In four Civil Years, these 6 hours amounted to 24 hours, the Quantity of a usual NightDay .

So every fourth vulgar year, a NightDay was added in the month of February of the Roman Calendar, so that fourth year contained 366 days. We commonly call this a leap year by reason of the Dominical letter (Ecclesiastially ordained), leaping or changing only one certain day in February.

Julius Caesar placed the day at *Sexto Kalendas Marti* or the sixth of the Kalends of March. The month of February that usually had 28 days was made to have 29. Thus, a leap year was called *Annus Bisextilis*.

The Romans used distinct Names for days of the week.

*Dies Solis* (or *Dominiea*) [Sun Day]

*Dies Luna* [Moon Day]

*Dies Martis* [Mars Day]

*Dies Mercurii* [Mercury Day]

*Dies Jovis* [Jupiter Day]

*Dies Veneris* [Venus Day]

*Dies Saturni* [Saturn Day]

They did not note the days as we do with A, B, C, D, E, F, G.

The Romans divided their day into *Calends*, *Nones*, and *Ides*.

I set forth these Days for a better understanding of the Roman Custom. But the Resolution to have Septenarie of Days (that is, the account of time by weeks) is of much greater antiquity (in this World of continuance).

The first Chapter of Genesis sufficiently declares the beginning of this orderly accounting by Seven. In the Scriptures it is very often expressed. In the Judaical month this week of Number of Seven days has been used by the phrases:

Teria Prima,	or Prima Sabbati,
Teria Secunda,	Secunda Sabbati,
Teria Tertia,	Tertia Sabbati,
Teria Quarto,	Quarta Sabbati,
Teria Quinta,	Quinta Sabbati,
Teria Sexta,	Sexta Sabbati
and Teria Septima	and Sabattium.

Dies Solis, Dies Lunas and the other Dies with Planetary names came to Christian knowledge by the use of the Doctrine of the Chaldeans.

Note

Long after the time of Christ, men have labored to compare the two kinds of years previously described.

It was found by the records of two thousand years that Annus Julianus (365 days and 6 hours) actually exceeds and has exceeded the length of the true natural Sun Year by some minutes of an hour.

Though these various ages the length of the Sun's Year did not, does not, and will not be the same length of time for any two consecutive years, the yearly difference is quite small (in our age, as well as in Ptolemy's time), being less than 15 seconds of an hour.

This is a very small portion of time when to be reckoned with the Artificial or Mechanical breadth of an hour line drawn on a Sun Dial. No mortal man's eye can discern this Quantity of a Mechanical time breadth of the moving or shifting of the place of the Indicating Shadow. But it actually does move and shift....

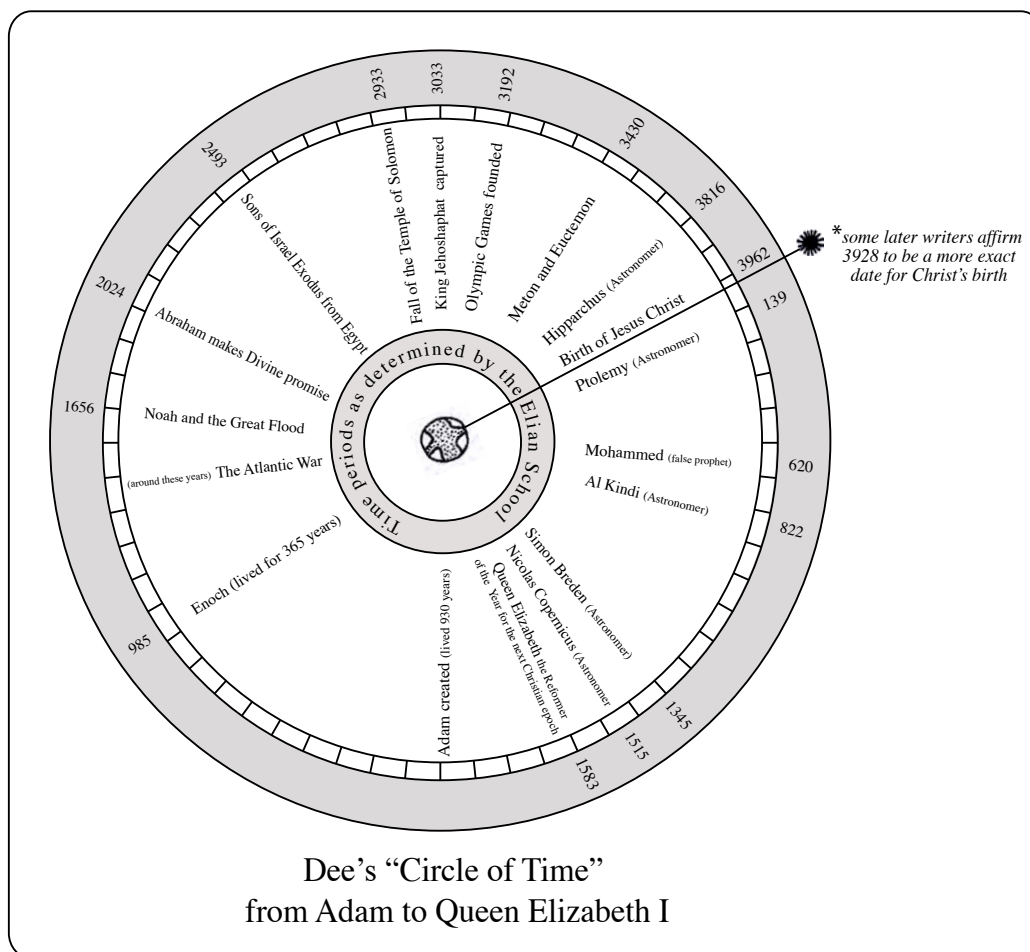
[...Over time] any man can discern and no man is so void of Reason to deny the Motion passed to have been great...

...Yea (as I said before) the Arithmetical and proportional account can be given of the Motion passed various uses of this can be devised consequently or Porismatically (as the Greek word is *porismatikos*).

[porisma means a deduction or corollary from a previous demonstration]

This Dial (which is divided into 360 equal parts) shows the time spent since the beginning of all time and the creation of time. Every one of these Astronomical Philosophers I have shown here have studied the length of the year.

The Astronomical observations of one man might easily be doubted, but of diverse men's observations (diligently made) in great length and distance of time (as in Centuries of years or more), very certainly, it is now demonstrable so to be.



### ***Clarifying Notes for Dee's "Dial of Time"***

The "Dial of Time" goes from Adam, Enoch and Noah, through the founding of Jerusalem, the Greek era, the time of Jesus and Ptolemy, then highlights several famous astronomers of the Middle Ages and the Renaissance. It ends with Queen Elizabeth who Dee touts as the "Reformatrix" (female Restorer) of the Year, thereby introducing the next great Christian epoch.  
[if she reforms the calendar, as Dee is heartily encouraging her to do]

Genesis 5:5 says Adam lived for 930 years

Genesis 5:23 says Enoch lived for 365 years

The Atlantic War took place in the mountains of Northern Africa.

Meton and Eucteman were famous Greek Astronomers who lived around 400 BC.

Hipparchus lived around 150 BC.

Ptolemy lived around 140 AD.

Al Kindi lived around 850 AD.

The English astronomer Simon Bredon (from Oxford) lived around 1350 AD.

Copernicus lived around 1525 AD.

Phaedo, a follower of Socrates, opened up the Elia School around 450 BC  
(in his home town of Elis, Greece, about 125 miles west of Athens)



### *There's lots more...*

Dee continues with over 50 more pages of technical astronomy relating to how the Julian Calendar has fallen out of line with the calendar of the heavens. He provides detailed data from all his main sources; Meton, Euctemon, Hipparchus, Ptolemy, Al Kindi, Simon Bredon, and Copernicus.

He warns that, without reform, Easter might be celebrated on an incorrect date. And he shows how the great astronomers like Regiomontanus of Konigsburg [Prussia] had come to the same conclusions.

Dee delivered his 62 page proposal to the Court on February 26, 1583.

Upon reading Dee's proposal the Privy council was enthusiastic about the calendar reform. Walsingham responded to Dee expressing his appreciation. Even the skeptical Cecil was on board. All that was needed was the approval of the Archbishop of Canterbury, Edmund Grindal.

Wooley reports that Cecil insisted a decision be made promptly, before November of 1583.

Grindal (who was at odds with Queen Elizabeth regarding other issues) probably never properly digested Dee's technical report.

He wrote the whole idea of calendar reform off as a "Papist" and said the matter must first be approved by all the Protestant Churches throughout Europe. Grindal knew full well this would never happen, especially in a matter of months, so he had effectively quashed the whole idea.

Dee was furious that Grindal couldn't see what was so blatantly scientifically accurate and obvious. Nonetheless, England did not reform its calendar. It wasn't until 1752 that England finally adopted the Gregorian Calendar. During those 170 years, communications and trade agreements generally had two dates: Old Style (OS) and New Style (NS).

Had Grindal been a little more open-minded, it would have saved 170 years of communication aggravations. But to Dee, even more exasperating was the fact that England's "Civil Time" remained out of sync with the "true" time of the cosmos.

Cecil might have been in a rush to settle the matter before November so that England would stay in step with the rest of Europe. Italy had changed in October of 1582 (October 4 became October 15), France followed on December 9, 1582, and Holland on January 1, 1583.

However Cecil might have been anxious to have England's change calendars to coincide with the settlement of the Gilbert/Peckham/Dee colony at the John Dee River and port. Perhaps, following Dee, he wanted the New Colony in the New World to commence in the New Time.

(Anthony Brigham's mission (with its two ships and a pinnace) had departed from England in April of 1582. Gilbert's delayed mission (with 5 ships) finally departed in June of 1583.)

### *Dee the poet*

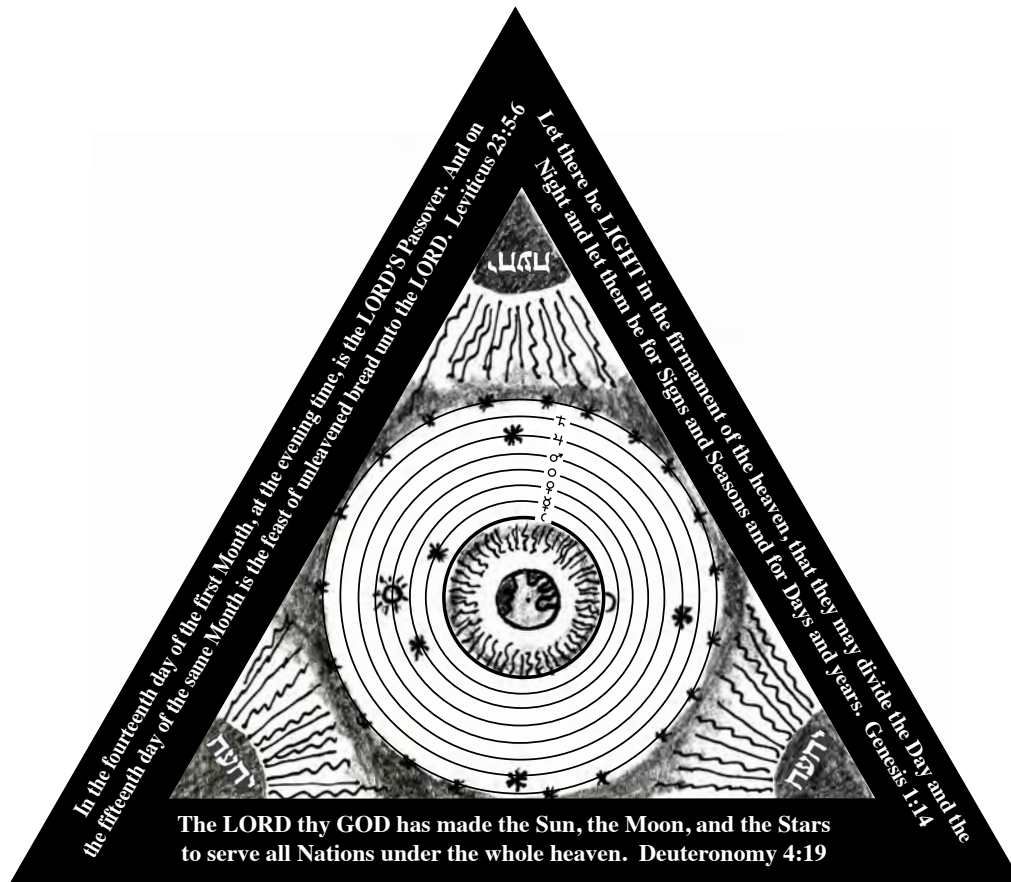
There are two other noteworthy parts of the Calendar Treatise: two poems penned by Dee.

As a introduction, Dee wrote four couplets to Lord Burghley. Perhaps he is referring to them in the title of this illustration (which preceeds them). Dee's depiction of the universe is clearly Trinitarian. YHWH (Jehova) radiates from three corners of the equilateral triangle, governing the earth, the 7 planets, and the fixed stars.

Along the edges are three biblical quotes that relate to Time. The title and the graphic are a curious mix of Quaternary and Ternary (particularly the three strange asterisks after the title).

### Primi Quatridui Mysterium \*\*\*

[Four Chief Mysteries]



To the right honorable and  
my singular good Lord,  
the L.Burghley,  
Lord Treasurer  
of England

TO OTI, and TO DIOTI,  
I show the thing, and reason why.  
At large, in brief, and middle wise,  
I humbly give a plain Advice.

For want of time, The Time Untrue,  
If I have missed, Command anew.  
Your Honor may; So shall you see,  
That Love of Truth, doth govern me.

*To conclude,  
Dee writes this poem comparing  
himself and Elizabeth  
to Sosigenes and Caesar.*

As Caesar and Sosigenes,  
The vulgar calendar did make.  
So Caesar's Peer, our true Empress,  
To Dee, his work she didt betake.

To find the Days superfluous,  
(Which Caesar's false hypothesis,  
Had Bred, to Nature, odious)  
Wherein, he found eleven amiss.

For he, from Christ, Chief Root of time  
The time did try, by heavenly writ:  
No Council can deem this a crime  
From Christ, to us, true time to fit.

Elizabeth our Empress bright,  
Who in the year of eighty three,  
Thus made the truth come to light,  
And Civil year with heaven agree.

But eighty four, the Pattern is  
Of Christ's birth year, and so for ay?  
Each Bissext shall fall little miss,  
To show the Sunn of Christ's birth day.

Three hundred years, shall not remove,  
The Sun, one day, from this new match.  
Nature, no more shall us reprove  
Her golden time, for all to watch.

The God of might, our father dear,  
Whose reign no time can comprehend,  
Good time our Elizabeth grant here  
And Bliss eternal, at her end

Amen



The Compendious Rehearsal,  
*of John Dee,*  
*his dutiful declaration and proof of the course and race of his studious life,*  
*for the space of half of a hundred years,*  
*now, by God's (favor and help) fully spent, etc.*

(THE COPY OF THE FORESAID SUPPLICATION TO HER MOST EXCELLENT MAJESTY)

Crossley's  
 page  
 3

Most gracious Queen,

Forasmuch as the intolerable extremity of the injuries and indignities, which your most excellent Majesty's faithful and dutiful servant, John Dee, has for some years last past endured, and still endures, is so great and manifold, as cannot in brief be expressed to your Majesty, neither without good proof and testimony have credit with your Majesty.

And because also, without speedy and good redress therein performed, it is to be doubted, that great and incredible inconveniences and griefs may ensue thereof in sundry sort; (which yet may easily be prevented) your Majesty's foresaid most humble and most zealously faithful servant beseeches your Majesty to assign two or more meet and worthy persons, nobly and virtuously minded, who may and will charitably, indifferently, advisedly, and exactly see, hear, and perceive, at the house of your Majesty's said servant in Mortlake, what just and needful occasion he has thus to make most humble supplication to your Majesty.

And so of things there seen, heard, and perceived, to make true and full report and description unto your Majesty. And thus your Majesty's foresaid most dutiful servant beseeches the Almighty God most mercifully, prosperously, and always to bless and preserve your most excellent Majesty royal. Amen.

November 9, 1592.

Be it remembered,

Crossley's  
 page  
 4

That this Supplication being exhibited unto her Majesty by the honorable Countess of Warwick on November 9th and read by her Majesty's self. Thereupon her Majesty immediately appointed the honorable Mr. Secretary Wolley, and Sir Thomas Gorge, Knight, Gentleman of her Majesty's Wardrobe, to be the two Commissioners, according to the tenor of this Supplication.

And so, the foresaid two honorable Commissioners came on November 22nd, 1592 to my house at Mortlake to see, hear, and perceive some things, according to the intent of the former Supplication. To whom being set at one table in the middle of my late library-room, and next before them two other great tables, being covered.

One, with very many letters and records of fifty years course, and testimonies of my studious life, in and from the most famous places and parties of all Christendom.

And the other with such diverse books of my making, printed and unprinted, as I had in my foresaid time written or devised: then I did begin my declaration, concurring orderly with the text of this book, purposely and by the Commissioners' advice, in some order of method most briefly and speedily contrived against this day.

---

A BRIEF NOTE AND ABSTRACT, IN DIVERSE CHAPTERS AND PRINCIPAL POINTS, TO BE CONSIDERED IN THE RACE OF THAT HALF HUNDRED YEARS, WHICH (WITH THE FAVOR AND HELP OF GOD) I HAVE ALREADY RUN, FOR ATTAINING OF GOOD LEARNING; SINCE MY FIRST BECOMING A STUDENT IN CAMBRIDGE IN NOVEMBER, 1542, AND NOW BEING NOVEMBER 22, 1592, BOTH PROVE THE RACE TO HAVE BEEN OF JUST HALF A HUNDRED YEARS.

## CHAPTER I.

### THE ENTRANCE AND GROUNDPLAT OF MY FIRST STUDIES.

In November of the Year 1542, I was sent by my father, Rowland Dee, to the University of Cambridge, there to begin with logic and so to proceed in the learning of good arts and sciences (for I had before, in London, and at Chelmsford, been properly well-furnished with understanding of the Latin tongue): I being then somewhat above fifteen years old, as being born July 13, 1527.

In the years 1543, 1544, 1545, I was so vehemently bent to study, that for those years I did inviolably keep this order; only to sleep four hours every night; to allow to meat and drink (and some refreshing after) two hours every day; and of the other eighteen hours all (except the time of going to and being at divine service) was spent in my studies and learning.

After I was Bachelor of Art, I went beyond the seas (May, 1547) to speak and confer with some learned men, and chiefly mathematicians, as Gemma Frisius, Gerardus Mercator, Gaspar à Mirica, Antonius Gogava, &c.

And after some months so spent about the Low Countries, I returned home, and brought with me the first astronomer's staff of brass, that was made of Gemma Frisius' devising, the two great globes of Gerardus Mercator's making, and the astronomer's ring of brass, as Gemma Frisius had newly framed it; and they were afterward left by me for the use of the Fellows and Scholars of Trinity College. Some proof hereof may appear by the letters of Mr. John Chistoferson, who afterward was Bishop of Chichester elect.

In this year of 1547, I began to make observations (very many to the hour and minute) of the heavenly influences and operations actual in this elemental portion of the world. Of which sort I made some thousands in the years then following: as may appear by my own writing in my Ephemerides, and in sundry other books purposely recorded and here lying before your Honor.

After St. John's College, I was chosen to be Fellow of Trinity College, at the first erection thereof by King Henry the Eight. I was also assigned there to be the Under-Reader of the Greek tongue, Mr. Pember being the chief Greek Reader then in Trinity College. Hereupon I did set forth (and it was seen of the University) a Greek comedy of Aristophanes, named in Greek *Εἰρήνη*, in Latin, *Pax*; with the performance of the Scarabeus his flying up to Jupiter's palace, with a man and his basket of victuals on her back: whereat was great wondering, and many vain reports spread abroad of the means how that was effected.

In that College also (by my advice and by my endeavors, diverse ways used with all the other Colleges) was their Christmas-Magistrate first named and confirmed an *Emperor*. The first was one Mr. Thomas Dunne, a very goodly man of person, stature, and complexion, and well learned also. They, which yet live, and were hearers and beholders, they can testify more, then is meet here to be written of these my boyish attempts and scholastic exploits.

In the Year 1548, I was made Master of Art, as may appear by the University's testimony under their scale, lying here on the table.

In the year 1548, I went over beyond the seas again, and never after that was I any more student in Cambridge: as may appear by the whole course of my life after that, manifestly testified by the letters and other records here before you.

I became a student at Louvain in 1548 at mid-summer, and there I made abode until July 15, 1550, as appears by the notes of my Ephemerides, and diverse letters sent to me from diverse parties, as being known to be at Louvain then.

Crossley's  
page  
5

Crossley's  
page  
6

## CHAPTER II.

HEREUPON FOLLOWED MY GOOD ESTIMATION AND CREDIT IN MATTERS OF GOOD  
LEARNING, BOTH ABROAD AND AT HOME IN ENGLAND.  
ABROAD AS FOLLOWETH:

Beyond the seas, far and near, was a good opinion conceived of my studies philosophical and mathematical. First, from Louvain did the favorable fame of my skill in good literature so spread, that thereupon diverse noblemen (Spaniards, Italians, and others) came from the Emperor Charles the Vth, his court at Bruxelles to visit me at Louvain, and to have some proof of me by their own judgements:

Crossley's  
page  
7

So came the Duke of Mantua to me: so came Don Luys de la Cerda, afterward Duke de Medina Coeli in Spain, unto me: so came to me, after them, from the Emperor's court at Bruxelles, the honorable Sir William Pickering, Knight, and there with me remained some time, and of me was instructed in logic, rhetoric, arithmetic, in the use of the astronomer's staff, the use of the astronomer's ring, the astrolabe, in the use of both globes, &c.

Then came some out of Bohemia to me, with strange and no vulgar opinion, settled in their imaginations, of my skill, as may appear by the Record of some part of the History in my Ephemerides noted.

Then came some out of Denmark to me, as Mathias Hacus, Danus, Regis Daniæ Mathematicus; Joannes Capito, Medicus Regis Daniæ, and a good mathematician also; as by letters lying on the table is evident.

There, for recreation, I looked into the method of the civil law, and profited therein so much, that in antimonies, imagined to be in the law, I had good hope to find out (well allowed of) their agreements; and also to enter into a plain and due understanding of diverse civil laws, accounted very intricate and dark. Of that my study in the law your honor hath on the table the testimony of the University of Louvain; and by other letters unto me about that time it may appear.

From Louvain I took my journey toward Paris on July 15, 1550, and came to Paris the 20th day of that month. Where, within a few days after (at the request of some English gentlemen, made unto me to do somewhat there for the honor of my country) I did undertake to read freely and publicly Euclid's Elements Geometrical, *Mathematicè, Physicè, et Pythagoricè*; a thing never done publicly in any University of Christendom.

My auditory in Rhemes College was so great, and the most part elder then my self, that the mathematical schools could not hold them; for many were glad just to be able to peer in the window of the school the windows, to be auditors and spectators, as they best could help themselves thereto.

Crossley's  
page  
8

I also dictated upon every proposition, beside the first exposition. And by the first four principal definitions representing to the eyes (which by imagination only are exactly to be conceived), a greater wonder arose among the beholders, than of my Aristophanes *Scarabeus* mounting up to the top of Trinity-hall in Cambridge *ut supra*. Of this mathematical reading very many testimonies lie here before you.



In that University of Paris, were at that time above forty thousand accounted students; some out of every quarter of Christendom being there. Among these very many of all estates and professions were desirous of my acquaintance and conference, as Orontius, Mizaldus, Petrus Montaureus, Ranconetus, Danesius, Jacobus Sylvius, Jacobus Goupylus, Turnebus, Straselius, Vicomercatus, Paschasius Hamelius, Petrus Ramus, Gulielmus Postellus, Fernelius, Jo. Magnionus, Johannes à Pena, &c. as by letters lying on the table may partly appear.

There I refused to be one of the French king's mathematical readers, with 200 French crowns yearly stipend offered me, if I would stay for it; I refused likewise a good stipend of Monsieur Babeu; and a better than that, of Monsieur de Rohan; and a better than that, of Monsieur de Monluc, who was then sent ambassador to the Great Turk.

And not only in Louvain and Paris Universities has God sent me good credit and estimation with the favor and love of very many (noble lovers of good learning, or well learned themselves), but also in Orleans, Cologne, Heidelberg, Strasburg, Verona, Padua, Ferrara, Bologna, Urbino, Rome, and (to conclude herein) in many other universities, cities, and towns of Christendom; as may appear by the multitude of letters and other records lying here to be seen and perused in this case; from the year 1547 till and in this present year of 1592.

A sufficient  
proof of my  
great foreign  
credit

To be most brief concerning my foreign credit, it may suffice me, a poor studious gentleman, for my foreign credit for ever; that in this tract of my studious race I might have served five Christian Emperors; namely, Charles the Fifth, Ferdinand, Maximilian, this Rodulph, and this present Muscovite: of every one their stipends directly or indirectly offered, amounting greater each, then other; as from 500 dollars yearly stipend to a 1000, 2000, 3000; and lastly, by a Messenger from this Russian or Muscovite Emperor, purposely sent, with a very rich present, unto me at Trebona castle, and with provision for the whole journey (being about 1200 miles from the castle, where I lay) of my coming to his court at Moscow (with my wife, children, and my whole family) there to enjoy at his Imperial hands £2000 sterling yearly stipend; and of his protector yearly a thousand rubbles; with my diet also to be allowed me free out of the Emperor's own kitchen: and to be in dignity with authority among the highest sort of the nobility there, and of his privy-counselors, &c.

Of this last great preferment offered, many Englishmen, yet living, and in this kingdom, be witnesses: the Landgrave of Hesse-Cassell his letter is ready to be showed, and other letters of men of credit can be sufficient testimony; besides the forerunner to seek me, and the ambassadors or messengers, their own writings thereof rest here before you.

Note: the Commissioners jointly read two of the testimonies of the Muscovite's great offers and promise.

Crossley's  
page  
9

CHAPTER III.  
MY CREDIT AND ESTIMATION IN ENGLAND,  
FOR THE MOST PART OF THE FORMER WHOLE RACE.

That may also appear evidently even from the beginning and original of it, with the increase thereof ensuing:

1. In the year 1547, by the letters of Mr. John Christopherson, afterward Bishop of Chichester, elect.
2. In the year 1548, by the University of Cambridge their letters testimonial, with their seal annexed.
3. By Mr. Cheke (afterward knight, and one of King Edward the Sixth's schoolmasters) whose good liking of me declared to Mr. Secretary Cecill (now the right honorable Lord Treasurer of England) was notified unto me by the letters of Mr. Peter Osborne, late Remembrancer of the Exchequer; and by the same I was sent for to come to the speech of the said Mr. Secretary on December 12, 1551, which I did, and yet I remember whereof his discourse with me then.
4. By King Edward his voluntary gift of a pension on a hundred crowns yearly; and after that, bettering that pension with bestowing on me (as it were by exchange) the rectory of Upton upon Severn; a sufficient testimony of his Majesty's presenting me to that rectory lay here, with an authentic seal annexed to it. May 19, 1553.
5. Mr. Secretary Cecill, now Lord Treasurer, his testimony by letter of my well bestowing of my time beyond the seas on May 28, 1563, is here.
6. I must highly esteem her Majesty's most gracious defending of my credit, in my absence beyond the seas, as concerning my book, titled *Monas Hieroglyphica* (dedicated to the Emperor Maximilian, in the Year 1564) against such University-Graduates of high degree, and other gentlemen, who therefore dispraised it, because they understood it not. Whereupon her most excellent Majesty (after my coming home from beyond the seas; when also I brought the Lady Marquess of Northampton from Antwerp by sea to Greenewich) did vouchsafe to read that book *obiter*, with me at Greenewich.
7. Of the University of Oxford, some of the chief students (Doctors of Divinity and Masters of Art) caused a yearly good stipend to be offered unto me to read the mathematical sciences there. Mr. Doctor Smith of Oriel College, and Mr. Dr. Bruarne of Christ's Church, were chiefly agents in that cause: In the Year 1554.
8. Mr. John Wolley his very courteous letters to me on June 8, 1568, who is now even your honor, the only Secretary for the Latin tongue to her most excellent Majesty, and one of her Majesty's privy-council; and here this day the chief Commissioner in my present most lamentable case of distress.

9. Mr. Secretary Cecill, now Lord Treasurer of England, his honorable offer of his courtly friendship by a letter written with his own hand on August 20, 1568.

10. The honorable Earl of Oxford his favorable letters in 1570.

11. Her Majesty's very gracious letters of credit for my marriage in 1575.

12. The right honorable Earl of Leicester's letters for the same.

Crossley's  
page  
11

13. Mr. Christopher Hatton (afterward Lord Chancellor of England) his letters for the same.

14. Her Majesty's favorable license and passport, with my two servants and our geldings in 1571. Two other Kings, their ambassadors (Leidgiers here) their passports at the same time, for free and safe traveling in their Prince's dominions, etc..

15. Sir Henry Sydney's honorable letters to me, while he was Lord Deputy in Ireland. Sir Henry Sydney's letters unto me, when he was Lord President in Wales.

16. The honorable Lady Sydney's most courteous and many letters to me, and inviting me to court, etc. in 1571.

17. Mr. Doctor Julius Cæsar's letters to me (who now is Judge of the Admiralty, and one of the Masters of Requests extraordinary) in 1577.

18. Sir Francis Walsingham his passport for my winter journey, in her Majesty's weighty affairs in 1578.

Omitting herein very many letters, and other things, testifying my honest credit here in England (with all degrees of the Nobility, Gentlemen, and University-Graduates), in and for the most part of all my studious race, these may suffice.

#### CHAPTER IV

##### SOME OTHER OF HER MAJESTY'S SPECIALLY GRACIOUS AND VERY BOUNTIFUL FAVORS TOWARD ME.

1. At her most excellent Majesty's first coming to Somerset house, her Majesty was willing, that, after Dr. Mallet, I should have had the Mastership of St. Katharine's, wherein Dr. Willson politically prevented me.

2. Her Majesty very graciously took me to her service, at Whitehall before her Coronation, being to her Majesty commended by the right honorable Earle of Pembroke, and the Lord Robert, after Earle of Leicester. At which time her Majesty used these words unto the said Lords, "Where my brother has given him a crown, I will give him a noble."

Crossley's  
page  
12



3. After this some years, at the Lady Marquess of Northampton her humble suit for me on December 8, 1564, her Majesty granted to me the Deanery of Gloucester, being then void: and a caveat was entered on my behalf; but the same deanery was afterward bestowed on one Mr. Man, who was sent to Spain in her Majesty's service.

(And now this Lent 1594, when it became void again, I made motion for it, but I came too late; for one, that might spend £400 or £500 a year already, had more need of it, then I liked; or else my former gift was but words only to me, and the fruit ever due to others, that can detect and catch better than I could do for these thirty-five years.)

4. Not long after, the Provostship of Eaton by some my friends in court, was humbly at her Majesty's hands sued for to my behalf, and favorable answers were given therein.

5. Her Majesty willed Mathew, Lord Archbishop of Canterbury, to grant me a dispensation for ten years, to enjoy the two rectories of Upton and Long-Lednam, and any other within that term, of me gotten. Which dispensation I enjoyed for only those two rectories.

6. After my journey into the dukedom of Loraine in 1571, in my very dangerous sickness I received chief help and comfort by her Majesty's great favor toward me, not only sending carefully and with great speed from Hampton Court unto me Dr. Apsloo and Mr. Balthrop (who faithfully and prosperously did their parts of skill with me), but also in sending the honorable L. Sidney in a manner to tend on me; to discern, how my health bettered, and to comfort me from her Majesty with divers very pithy speeches and gracious, and also with divers rarities to eat, to increase my health and strength: the most dutiful and thankful memory whereof shall never die.

Crossley's  
page  
13

7. Her Majesty's most gracious offer was sent home to my house by Mistress Blanche à Parry of any whatsoever ecclesiastical dignity within her kingdom, being then or shortly becoming void and vacant, to make me owner: when both bishoprics and deaneries were void, and more became shortly after void: but my most humble and thankful answer to her Majesty by the same messenger, was, that, *cura animarum annexa* [being responsible for the "caring of souls"] did terrify me to deal with them.

8. Her Majesty not long after, as your Honor, Mr. Secretary Wolley, can well remember and testify, for some better maintenance for me, then of those two rectories only, which I then had, declared her most gracious will and pleasure to be, that I should have of her Majesty's gift other ecclesiastical livings and revenues, (without cure of souls annexed) as in her Majesty's books are rated at two hundred pounds yearly revenue. Of her Majesty's gift, I never as yet had any one penny.

9. Her Majesty (the last day of July, 1583) being informed by the right honorable Earle of Leicester, that whereas the same day, in the morning, he had told me that his Honor and the Lord Laskey would dine with me within two days after. I confessed sincerely to him, that I was not able to prepare them a convenient dinner, unless I should presently sell some of my plate or some of my pewter for it. Whereupon her Majesty sent to me very royally within one hour after forty angels of gold, from Syon, where her Majesty had recently gone, by water from Greenwich.

What can better  
witness her  
Majesties most  
gracious goodwill  
and desire to further  
my studies in  
her service  
than this parcel  
of her Majesties  
speech uttered  
the same day to  
another such a one  
as you may see  
in the letter  
itself he wrote

The great seal  
by negligence  
still wanted;  
for of course  
it was to have  
been put to  
within a  
certain time  
after

10. Her Majesty by Mr. Christopher Hatton's letters (afterward Lord Chancellor of England) signified to Edmond, Lord Archbishop of Canterbury, his good grace (in 1576) that her pleasure was, "That, in any case, I should, during my life natural, be dispensed with to enjoy those two rectories of Upton and Long-Lednam," which I then had.

Thereupon at length (later, in 1582) the said Archbishop performed his part and set his seal thereto. But when I should have followed the getting out of the great seal unto it, I was wholly employed (at her Majesty's and the right honorable the Privy Counselors, their commandment) about the Reformation of the Calendar.

Which office anciently did appertain to the bishops, and I would now they had showed their skill therein then; so would they have made more account now to help him up, who fell into the loss of above a thousand pounds since (The loss of the two Rectories is of more loss in rent due and for time of life to come than £1000) for not following his own business, but was occupied to bear their burden; indeed at her Majesty's commandment, and not at theirs. Also I had small thanks at their hands any way, nay, great hindrance; seeing her Majesty's absolute intent and caveat to my benefit was no better regarded among them in due time.

11. Her Majesty most graciously both for my great credit increasing and confirming, as well abroad as at home; and also of the better safety of me and mine to come so long and dangerous a journey and voyage in (as from the farthest parts of the Kingdom of Bohemia, hither); sent her most princely and royal letters of safe conduct for me, my companion, and our families to all foreign Princes and Potentates, etc. in 1588, the copy whereof I received from your honor, Mr. Secretary Wolley.

12. Since which my last coming home into England, her Majesty a little before Christmas in 1590, hearing of my great want of ability to keep house accordingly, as by all reason might be expected at my hands, did presently declare her most gracious good intent and will to help me with one hundred pounds of money out of her Majesty's privy purse.

This intent and promise, some once or twice after, as I came in her Majesty's sight, she repeated to me; and thereupon sent to me fifty pounds to keep my Christmas with that year; but what is become of the other fifty, truly I cannot tell. If her Majesty can, it is sufficient: *Satis citò, modò satis bene*, must I say. ["enough quickly is just well enough," in other words, getting some of the money promptly was better than getting all of it simply promised at a later date]

13. And shortly after her Majesty very graciously sent her will and pleasure in the right honorable Lord Treasurer his letters to this present Lord Archbishop of Canterbury, his good Grace, that he should "take some order for my present maintenance."

Here is the copy of the very letters, as I had it by my Lord of Canterbury's commandment: but yet no penny of rent, fee, or revenue is bestowed on me, being now almost two years since. (And not it is more than three years and three months since, and not yet any farthing of certain fee or revenue will be found or gotten for me.)

Crossley's  
page  
14

Crossley's  
page  
15

14. Again, seeing no present help was yet come in 1592, in April last, but want and discredit grew more and more upon me: thereupon my friends devised a suit to her Majesty for me, by obtaining whereof chiefly her Majesty might be found my gracious and very favorable sovereign Lady.

Secondly I thereby might win some credit; as with all men generally, who should understand of such her Majesty's good and gracious favor toward me, her ancient servant; and especially with my creditors, who would wish that my present little ability should be much amended thereby.

And so it came to pass by her Majesty's very bountiful purpose in giving unto the right worshipful Doctor Aubrey, one of the Masters of Requests, permission to endow me with a rectories, with vicarages, in St. David's diocese, when any of them shall become vacant. This indeed would have been only five of her Majesty's gift, and the yearly valuation of them five in one sum amounting to only 74 *l*, 11*s*, 2*d*., and not so much better at this day, than their said valuation, that they may be accounted worth one hundred pounds to any thrifty occupier of them.

And yet some did unduly esteem them to be of great value. Indeed to this hour (April 10, 1594) there never came a penny unto me of them. Nor is it certain, whither ever or never they shall, but I am very certain about the charges sustained about the writings and seals belonging to them.

15. By reason hereof in the last years (1591) progress entering at Greenwich, her Majesty was informed by the honorable and very virtuous Countess of Warwick of my great wants still increasing. Her Majesty was then by the said Countess in most humble manner requested, to grant to me, upon the next avoidance, the Mastership of St. Crosse's by Winchester, being an office and living of much like quality as St. Katherine's.

Whereunto her Majesty's most bountiful and provident answer was, "that I should have it, if it were a living fit for me," with which gracious answer I held my self contented, knowing that her Majesty had, or after that might have bishoprics enough vacant. Unto one of which the worshipful Mr. Doctor Bennet (the present incumbent of the Mastership of St. Crosse's) might be persuaded to be promoted unto by her Majesty; especially if the bishopric be of better living far, than S. Cross' or by commendams were hoped to be of better revenue.

(It is to be noted, that about after Doctor Watson: whereupon I hoped to have had that living long since; but at length I found that it was endowed to Dr. Bennet, better speeding than my former grant at her Majesty's hand. Mistress Blanche à Parry and Mistress Skydamore, now the Lady Skydamore, had obtained her Majesty's grant to me so long since.)

16. This year also again (1592 at None-such), the same suite was renewed unto her Majesty by the aforesaid Countess of Warwick: as well in respect of my incredible want of due maintenance, as for that the most Reverend Father in god, this L. Archbishop of Canterbury, his good Grace, very often times, and to diverse affirmed, and still affirms, that this Mastership of S. Crosse's is a living most fit for me, and I fit for it.

And also the right honorable Lord Treasurer, since that time and very lately at Hampton court, is of the same mind herein, as the Lord Archbishop is; as his Honor has very lately to my self declared: and with his hand very earnestly smitten on his breast used these very words\* to me, "By my faith, if her Majesty be moved in it by any other for you, I will do what I can with her Majesty to pleasure you therein, Mr. Dee." And so I thanked his Honor humbly, and have great confidence in his Honor's very favorable promise.

\* Mr Henry Maynard was by and heard the words at Hampton Court, in my Lord's own chamber, Nov. 6, 1592



And the rather seeing her Majesty's last answer at Nonesuch was even as the first, "that I should undoubtedly have it, if it were fit for me;" and moreover willed, that a caveat should be entered for me thereupon, as a most gracious Queen, for the more assurance of her poor servants relief and comfort. Of which her Majesty's most gracious answer, the foresaid L. Archbishop his good Grace being then at the Court at Nonsuch, was made privy presently; and to the right honorable Lord Treasurer I have myself declared it lately at Hampton Court.

Crossley's  
page  
17

17. Since which time I hearing of bishoprics, some void, and some shortly to become void, and hearing of diverse nominated to be promoted to them; but hearing no speech made of Mr. Doctor Benet, a man very worthy and sufficient to be a bishop, I began to doubt, that her Majesty hitherto has not been given to understand fully the truth of my present very hard case and incredible distress, through unseemly want of all things necessary for due maintenance of me and mine, contrary to her Majesty's will.

Hereupon on Wednesday was a sevensnight the honorable Countess of Warwick preferred my former supplication (set in the beginning of this little book) unto her Majesty, who very graciously did read it over herself, and granted the petition thereof; and so straight way nominated your Honor, Mr. Secretary Wolley, and you, Sir Thomas Gorge Knight, Gentleman of her Majesty's Wardrobe, as being very worthy and sufficient men, right nobly minded, to be the Commissioners, charitably, advisedly, and exactly to hear and see what I have to say or show unto you, needful to be considered of; so as speedy and sufficient redress and help may be had thereupon.

The Queen's Majesty with her most honorable Privy Council, and other her lords and nobility, came purposely to have visited my library; but finding that my wife was within four hours before buried out of the house, her Majesty refused to come in; but willed me to fetch my glass so famous, and to show to her some of the properties of it, which I did; her Majesty being taken down from her horse (by the Earl of Leicester, Master of the horse, by the Church wall of Mortlack), did see some of the properties of that glass, to her Majesty's great contentment and delight, and so in most gracious manner did thank me, etc.

Sept. 17,  
1580

The Queen's Majesty came from Richmond in her coach the higher way of Mortlake field, and when she came right against the Church, she turned down toward my house; and when she was against my garden in the field, here Majesty stayed there a good while, and then came into the street at the great gate of the field, where her Majesty saw me at my door, making reverent and dutiful obeisance to her; and with her hand her Majesty beckoned for me to come to her, and I came to her coach side; her Majesty then very speedily pulled off her glove and gave me her hand to kiss; and to be short, her Majesty willed me to resort oftener to her Court, and by some of her Privy Chamber to inform her Majesty when I am there, etc.

Crossley's  
page  
18

October 3, 1580. About 11 o'clock before noon I delivered my two Rolls of the Queens Majesty's title to her in the garden at Richmond; when her Majesty very graciously accepting of my endeavor and labor therein, appointed after dinner to hear further of the matter. Therefore between one and two in the afternoon, I was sent for into her Highness Privy Chamber, and whether the Lord Treasurer was also come before.

Then, upon her Majesty's rehearsing with his Honor my endeavors to satisfy her Majesty's desire to understand somewhat effectually of the title to foreign countries, and of my pains taken in those great Rolls penning down, required the Lord Treasurer to consider of the matter, the records, testimonies, and arguments by me there set down.

But thought he Lord Treasurer did seem at first to doubt of the value of the work, or pithiness thereof, her Majesty wished his Honor to peruse the whole thing accordingly, and to make report to her Majesty, what he found therein, etc. The commandment I received from her Majesty for me to certify my knowledge herein, may appear by this letter.

October 10, 1580. The Queen's Majesty to my great comfort (*horâ quintâ*) [in the fifth hour] came with her train from the Court, and at my door graciously calling me to her, on horseback exhorted me briefly to take my mother's death patiently: and with all told me, that the Lord Treasurer had greatly commended by doings for her title royal which he had to examine.

Crossley's  
page  
19

The which title in two rolls of vellum parchment his Honor had some hours before brought home, and delivered to Mr. Hudson for me to receive at my coming from my mother's burial at church. Her Majesty remembered also then, how at my wife's burial it was her fortune likewise to call upon me at my house, as before is noted.

January 11, 1568, *more Astronomico*. The right honorable Earl of Pembroke did present my book of *Propaedeumata Aphoristica* to her Majesty in my behalf, as I was so advised to do by the honorable Mr. Secretary Cecill, now Lord Treasurer, to whom I had humbly given one of them the day before; and likewise one to the said Earl to use or give away at his pleasure, and likewise one to the said earl.

Within three days after the said Earl told me of her Majesty's gracious accepting and well liking of the said book; and he gave me very bountifully in his own behalf xx lib. to requite such my reverent regard of his Honor.

February 16, 1568, (*more Astron.*). Her Majesty had very gracious talk with me in her Gallery at Westminster (*hora 2. vel circiter*) [around 2 o'clock] as concerning the great secret for my sake to be disclosed unto her Majesty by Nicolaus Grudius Nicolai, sometime one of the Secretaries to the Emperor Charles the Fifth, etc. What was the hindrance of the perfecting of that purpose on all sides, God best knoweth.

June 14, 1564. After my return from the Emperor's court, her Majesty very graciously vouchsafed to account herself my scholar in my book, written to the Emperor Maximilian, entitled *Monas Hieroglyphica*. And said, whereas I had prefixed in the forefront of the book: *Qui non intelligit, aut taceat, aut discat*: if I would disclose to her the secrets of that book, she would *et discere et tacere*. Whereupon her Majesty had a little perusal of the same with me, and then in most heroically and princely wise did comfort me and encourage me in my studies philosophical and mathematical, etc.

[The axiom reads "He who does not understand should either be silent or learn."  
If Dee were to explain it to her, the Queen promised to "learn and be silent,"  
meaning she would not divulge its secrets to others.]

## CHAPTER V.

### SOME MY DUTIFUL SERVICES DONE UNTO HER MAJESTY IN THE SPACE OF THIRTY-FOUR YEARS AND MORE.

Crossley's  
page  
20

1. Before her Majesty's coming to the crown, I did show my dutiful good will in some travails for her Majesty's behalf, to the comfort of her Majesty's favorers then, and some of her principal servants, at Woodstock, and at Milton by Oxford, with Sire Thomas Bendger (then Auditor to her Majesty), and at London; as Mr. Richard Strange and Mr. John Asheley, now Master of her Majesty's Jewell house, might have testified, and as I could have brought to their remembrance.

Upon suspicion of which my service then, and upon the false information given in by one George Ferrys and Prideaux, that I endeavored by enchantments to destroy Queen Mary, I was prisoner at Hampton Court, even in the week next before the same Whitsontide, that her Majesty was there prisoner also. I remained long prisoner, and all doors of my lodgings in London sealed up; and with other circumstances of grief, loss, and discredit for a while endured under the keeping of diverse overseers: as first in Court under Sir John Bourne, Secretary: while by writing I answered first four articles, and thereupon eighteen other, administer unto me by the right honorable the Privy Council.

Then from thence I was sent on Whitesun-even with the guard by water to London to the Lord Broke, Justice of the Common Pleas; from thence at length to the Star Chamber: where I was discharged of the suspicion of treason, and was sent to the examining and custody of Bishop Bonner for religious matters. Where also I was prisoner long, and bedfellow with Barthlet Grene, who was burnt: and at length upon the King and Queen's clemency and justice, I was (on August 19, 1555) enlarged by the Council's letters; being notwithstanding first bound in



recognizance for ready appearance and the good abearing for about some four months after; which letter of the Council's is in print here to be seen: as the forepart of this narration may be seen in the records of the Council Chamber of that year, month, and day, if they be extant.

2. Before her Majesty's coronation I wrote at large; and delivered it for her Majesty's use by commandment of the Lord Robert, after Earl of Leicester, what in my judgment the ancient astrologers would determine of the election day of such a time, as was appointed for her Majesty to be crowned in. Which writing, if it be extant and to be had, will be a testimony of my dutiful and careful endeavor performed in that, which in her Majesty's name was enjoined by me: in the year 1558.

3. Her Majesty took pleasure to hear my opinion of the comet appearing in 1577: whereas the judgment of some had unduly bred great fear and doubt in many of the Court; being men of no small account. This was at Windsore, where her Majesty most graciously, for three \* diverse days, did use me; and, among other points, her most excellent Majesty promised to me great security against any of her kingdom, that would, by reason of any my rare studies and philosophical exercises, unduly seek my overthrow. Whereupon I again to her Majesty made a very faithful and inviolable promise of great importance. The first part whereof, God is my witness, I have truly and sincerely performed; though it be not yet evident, how truly, or of what incredible value: The second part by God his great mercy and help in due time be performed, if my plat for the means be not misused or defaced.

\* Of these three days at Windsor Mrs. Skydamor, now Lady Skydamor, has some remembrance.

4. My careful and faithful endeavors was with great speed required (as by diverse messages sent to me one after another in one morning) to prevent the mischief, which diverse of her Majesty's Privy Council suspected to be intended against her Majesty's person, by means of a certain image of wax, with a great pin stuck into it about the breast of it, found in Lincolnes Inn fields, &c., wherein I did satisfy her Majesty's desire, and the Lords of the honorable Privy Council within few hours, in godly and artificial manner: as the honorable Mr. Secretary Wilson, whom, at the least, I required, to have by me a witness of the proceedings: which his Honor before me declared to her Majesty, then sitting without the Privy Garden by the landing place at Richmond: the honorable Earle of Leicester being also by.

5. My dutiful service was done, in the diligent conference, which, by her Majesty's commandment, I had with Mr. Dr. Bayly, her Majesty's Physician, about her Majesty's grievous pangs and pains by reason of toothache and the rheume, &c. in October, 1578.

6. My very painful and dangerous winter journey, about a thousand five hundred miles by sea and land, was undertaken and performed to consult with the learned physicians and philosophers beyond the seas for her Majesty's health-recovering and preserving; having by the right honorable Earle of Leicester, and Mr. Secretary Walsingham but one hundred days allowed to me to go and come again in 1578. My passport here may somewhat give evidence, and the journal little book of every day's journey or abode for those hundred days account may suffice.

7. My great, faithful, and careful attendance about the Lady Marquess of Northampton (in 1564) both beyond the seas, on the seas, and here in England, was performed with her Majesty's good will and well liking of. Whereupon her Majesty was the more willing, at the suite of the said Lady Marquiss, to give to me, for some recompense, the deanery of Gloucester; but I was disappointed, as I have before specified, of the enjoying of it.

8. My faithful diligence and earnest labor, with some cost, was bestowed, by her Majesty's commandment, to set down in writing, with hydrographical and geographical description, what I then had to show or say, as concerning her Majesty's title royal to any foreign countries. Whereof, the two parchment great rolls full written, of about xii whole vellum-skins, are good witness here before you. For copy whereof I have refused an hundred pounds in money offered by some subjects of this kingdom: but it was not meet for me to take it.

9. My dutiful labor, commanded by her Majesty, upon the Gregorian publishing of a Reformation of the vulgar Julian year, may here appear to you in these two written books, having been read and examined by learned mathematicians (thereto assigned by the honorable Lords of the Council) and by their skills also warranted; and by the Lords of the Council and by the Barons of the Exchequer well liked off, for the manner of execution of it without any public cumber or damage, &c. in 1582.

Crossley's  
page  
23

10. I sent very dutifully, humbly, and faithfully out of Bohemia (in 1585) letters to her sacred Majesty, requesting an expert, discrete, and trusty man to be sent to me in Bohemia, to hear and see, what God had sent to me and my friends there at that time; at which time, and till which time, I was chief governor of our philosophical proceedings; and by both our consents, there was somewhat prepared and determined upon to have been sent to her Majesty, if the required messenger had been sent by her Majesty to us. But not long after (so soon as it was perceived, that my faithful letters were not regarded therein) by lithe and lithe I became hindered and crossed to perform my dutiful and chief desire; and that, by the fine and most subtle devises and plots laid, first by the Bohemians, and somewhat by Italians, and lastly by some of my own countrymen. God best knows how I was very ungodly dealt withal, when I meant all truth, sincerity, fidelity, and piety toward God, and my Queen and country.

Her sacred  
Majesty  
best knoweth  
my sincere,  
zealous,  
constant, and  
dutiful fidelity  
toward her.

And so to conclude this chapter: if in any other points, besides the fore-rehearsed, I have done my dutiful service any way to her Majesty's well liking and gracious accepting, I am greatly bound to thank Almighty God, and during my life to frame the best of my little skill to do my bounden duty to her most excellent Majesty.

(Dee's text continues for about 40 more pages.)

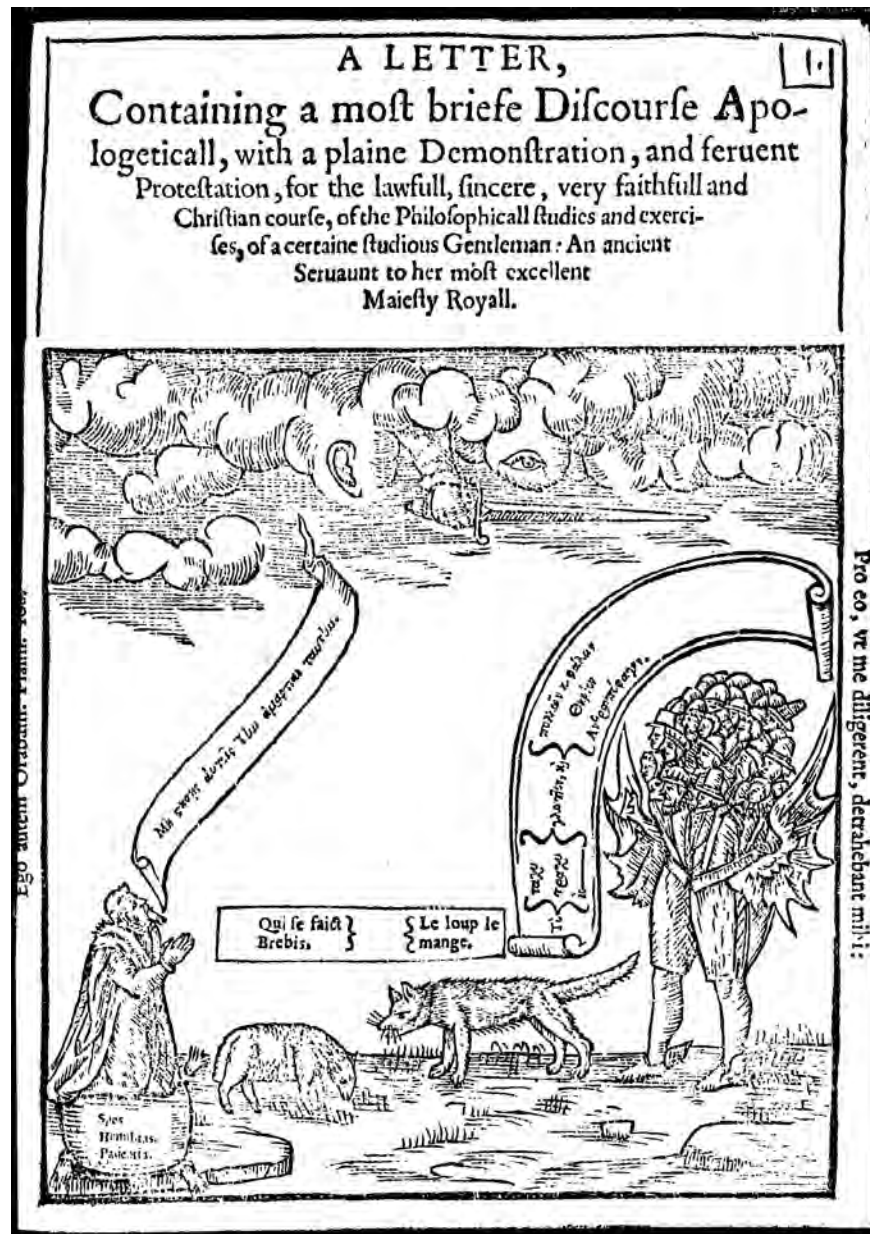
[From *Autobiographical Tracts of Dr. John Dee*,  
edited by James Crossley esq., Chetham Society, 1851;  
Courtesy of the Library of Congress, Washington DC]

## Discourse Apologetical

(Dee wrote this appeal for financial assistance to Queen Elizabeth in 1594. It was printed in 1599)

1594

Original in  
Elizabethan  
English

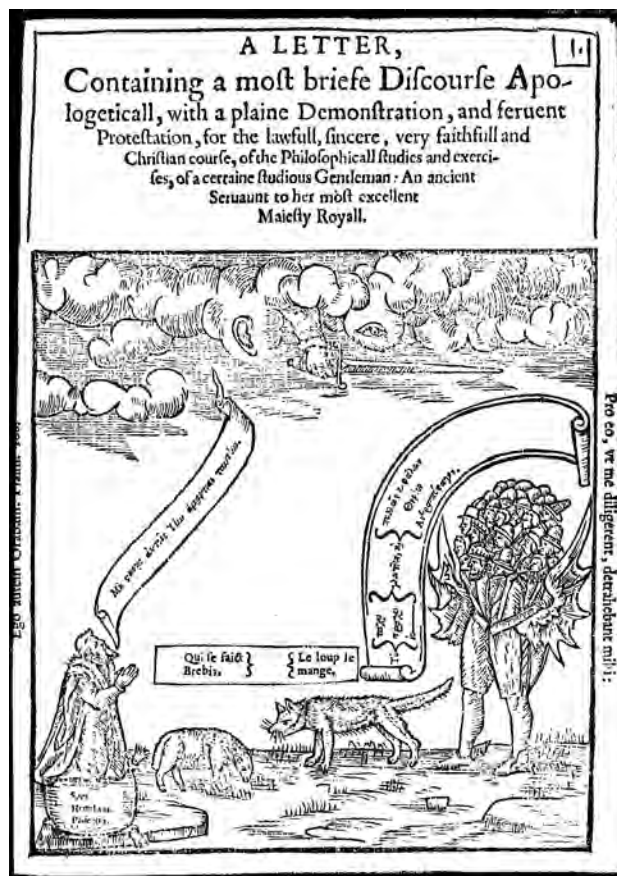


Some of Dee's Greek letters are challenging to read:

μη στήσης αὐτοῖς τὴν ἁμαρτίαν ταύτην

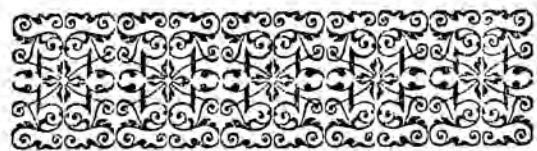
τὸ { ταχύ-  
τραχύ-  
ιό- } γλωπτον, και { πολλών κεφάλων  
θηρίον  
νθρωπόφαγον.





### A Letter

much, to stop the mouthes, and, at length to stay the impudent attemptes, of the rash, and malicious deuifers, and contriuers of most vntrue, foolish, and wicked reports, and fables, of, and concerning my foresaid studious exercises, passed ouer, with my great, (yea incredible) paines, trauels, cares, and costs, in the search, and learning of true Philosophie; As, therein, So, to certifie, and satisfie the godly and vnpartiall Christian hearer, or reader hereof: That, by his own iudgement, (vpon his due consideration, and examination of this, no litle parcell, of the particulars of my foresaid studies, and exercises philosophicall annexed) He will, or may, be sufficiently informed, and periwaded; That I haue wonderfully labored, to finde, follow, vse, & haunt the true, straight, and most narrow path, leading all true, deuout, zealous, faithfull, and constant Christian students, *ex valle hac miserie, & miseria istius vallis: & tenebrarum Regno; & tenebris istius Regni, ad montem sanctum Syon, & ad caelestia tabernacula.* All thanks, are most due, therefore, vnto the Almighty: Seeing, it so pleased him, (euen from my youth, by his diuine fauor, grace, and helpe) to insinuate into my hart, an insatiable zeale, & desire, to knowe his truth: And in him, and by him, incessantly to seeke, and listen after the same; by the true philosophicall method and harmony: proceeding and ascending, (as it were) *gradatim*, from things visible, to consider of things inuisible: from things bodily, to conceiue of things spirituall: from things transitorie, & momentanie, to meditate of things permanent: by things mortall (*visible and inuisible*) to haue some perceiurance of immortality. And to conclude,



To the most Reuerend father in God,  
the Lord Archbishop of Canturbury, Primate  
and Metropolitan of all England, one of her Ma-  
iesties most honorable priuy Counsaile:  
*my singular good Lord.*

**M**ost humbly and hartly I craue your Graces pardon, if I offende any thing, to send, or present vnto your Graces hand, so simple a discourse as this is: Although, by some sage and discreet my friends their opiniō, it is thought not to be impertinent, to my most needfull suites, presently in hand, (before her most excellent Maiefty Royall, your Lordships good Grace, and other the Right honorable Lordes of her Maiesties priuy Counsaile) to make some part of my former studies, and studious exercises (within and for these 46, yeeres last past, vsed and continued) to be first knowne and discouered vnto your Grace, and other the Right honorable my good Lordes, of her Maiesties priuy Counsaile: And, Secondly, afterwarde, the same to be permitted to come to publike view: Not so

A 2 much

### Apologetically.

clude, most briefly; by the most meruailous frame of the *whole World*, philosophically viewed, and circumspectly wayed, numbred, and measured (according to the talent, & gift of God, from aboue allotted, for his diuine purposes effecting) most faithfully to loue, honor, and glorifie alwaies, the *Framer*, and *Creator* thereof. In whose workmanship, his infinite goodnesse, vnsearchable wisdom, and Almighty power, yea, his euerlasting \* power, and \* Pauls to the Rom. Cap. 1. verse 19, 20. diuinity, may (by innumerable meanes) be manifested, and demonstrated. The truth of which my zealous, careful, and constant intent, and endeuour specified; may (I hope) easilie appeare by the whole, full and due suruey, and consideration of all the Bookes, Treatises, and discourses, whose Titles onely, are, at this time, here annexed, and expressed: As they are set down in the sixt Chapter, of an other litle *Rhapsodicall* Treatise, intituled, *The Copendious Rehearsall, &c.* writte aboue two yeares since: for those her Maiesties two honorable Commissioners; which her most excellent Maiefty had most gracioulsie sent to my poore Cottage, in Mortlake: to vnderstand the matters, and causes at full; through which, I was so extremely vrged to procure at her Maiesties handes such honorable surueys & witnesses to be assigned, for the due prooffe of the contents, of my most humble and pitifull supplication, exhibited vnto her most excellent Maiefty, at Hampton

Court, *An. 1592. Nouemb. 9.*

Thus therefore (as followeth) is y<sup>e</sup> said 6. Chapter there, recorded.

A 3

My



## A Letter

My labors and paines bestowed at diuers times, to pleasure my natiue Countrey: by writing of sundry Bookes, and Treatises: some in Latine, some in English, and some of them, written, at her Maiesties commandement.

Of which Bookes, and Treatises, some are printed, and some vnprinted. The printed Bookes, and Treatises are these following:

1. *Propædæmata Aphoristica, De præstantioribus quibusdā Naturæ virtutibus. — Aphorismi. 120. — Anno. 1558.*
2. *Monas Hieroglyphica, Mathematicè, Anagogicèque explicata; ad Maximilianum (Dei gratia) Romanorum, Bohemie, & Hungarie, Regem sapientissimum an. 1564.*
3. *Epistola ad eximium Ducis Vrbini Mathematicum (Fredericum Commandinum) præfixa libello Machometi Bagdedini, De superficierum Diuisionibus; edito in lucem, operamque, & eiusdem Commandini Vrbinati; Impressa Pisauri — Anno — 1570.*
4. *The Brytish Monarchy (otherwise called the Petty Navy Royall:) for the politique security; abundant wealth, and the triumphant state of this kingdome, (with Gods fauor) procuring — Anno — 1576.*
5. *My Mathematicall preface annexed to Euclide, (by the right worshipfull Sir Henry Billingsley Knight in the English language first published) written at the earnest request of sundry right worshipfull Knights, and other very well learned men. Wherein are many Arts, of me, wholly inuented (by name, definition, propriety and use,) more then either the Græcian, or Roman Mathematicians, haue left to our knowledge — Anno — 1570.*

My

## A Letter

prosse recorded: and in 12 Velam skins of parchment, saire written: for her Maiesties vse: and at her Maiesties commandement — anno — 1578

12. *De Imperatoris Nomine, Authoritate, & Potentia: dedicata to her Maiesly — anno — 1579*
13. *Prolegomena & Diſſata Parisiensia, in Euclidis Elementorum Geometricorum, librum primum, & secundum; in Collegio Rhemensi — anno — 1550.*
14. *De vsu Globi Celestis: ad Regem Edoardum sextum. 1550*
15. *The Art of Logicke, in English — anno — 1547.*
16. *The 13. Sophisticall Fallacijs, with their Discoueries, written in English meter — anno — 1548.*
17. *Atercurius Celestis: libri — 24. written at Louayn — 1549.*
18. *De Nubium, Solis, Lune, ac reliquorum Planetarum, in mōd ipsius stelleris Calis, ab infimo Terræ Centro, distantijs, mutijsq; interuallis, & eorundem omnium Magnitudine liber ἀποδεικνυς, ad Edoardum Sextum, Angliæ Regē. Anno — 1551.*
19. *Aphorismi Astrologici — 300. — anno — 1553.*
20. *The true cause, and account (not vulgar) of Fluds and Ebbs: written at the request of the right honorable Lady, Lady Iane, Duchesse of Northumberland — anno — 1553.*
21. *The Philosophicall and Poeticall Originall occasions of the Configurations, and names of the heauenly Asterismes — written at the request of the same Duchesse. Anno. 1553.*
22. *The Astronomicall, & logissicall rules, and Canons, to calculate the Ephemerides by, and other necessary accounts of heauenly motions: written at the request, and for the vse of that excellent Mechanicien Maister Richard Chancelor, at his last voyage into Moschonia — anno — 1553.*
23. *De Acrilogia Mathematica; volumen magnum: sexdecim continens libros — anno — 1555*

Inuentum

## Apologeticall.

- |   |    |
|---|----|
| My diuers & many Annotations, and Inuentions Mathematicall, added in sundry places of the foresaid English Euclide, after the tenth Booke of the same — 1570. | 6. |
| Epistola præfixa Ephemeridibus Ioannis Felde Angli: cui rationem declaraueram Ephemerides conscribendi. 1557.   | 7. |
| Paralatica Cōmentationis, Præcepsq; Nucleus quidā. 1572   | 8. |

The vnprinted Bookes and Treatises, are these: some, perfectly finished: and some, yet vnfinished.

- |   |     |
|---|-----|
| The first great volume of Famous and rich Discoueries: wherein (also) is the History of King Salomon, euery three yeeres, his Ophirian voyage. The Originals of Presbyter Ioannes: and of the first great Cham, and his successors for many yeeres following: The description of diuers wonderfull Isles, in the Northern, Scythian, Tartarian, and the other most Northern Seas, and neere vnder the North Pole: by Record, written aboue 1200. yeeres since: with diuers other rarities — Anno — 1576.  | 9.  |
| The Brytish Complement, of the perfect Art of Nauigation; A great volume: in which, are contained our Queene Elizabeth her Arithmetickall Tables Gubernauticke: for Nauigation by the Paradoxall compasse (of me, inuented anno 1557.) and Nauigation by great Circles: and for longitudes, and latitudes; and the variation of the compasse finding most easilie, and speedily: yea, (if neede be) in one minute of time, and sometime, without sight of sunne, moone, or star; with many other, new and needefull inuentions Gubernauticke — anno — 1576. | 10. |
| Her Maiesties Title Royall, to many forraign Cuntries, kingdomes, and prouinces, by good testimony and sufficient proosse   | 11. |

## Apologeticall.

- |  |     |
|--|-----|
| Inuentum Mechanicum, Paradoxum, De noua ratione delineandi Circumferentiam Circularem: vnde, valde rara alia excogitari persicque poterunt problemata. An. 1556.   | 24. |
| De speculis Comburentibus: libri sex — Anno — 1557.  | 25. |
| De Perspectiua illa, qua peritissimi vtuntur Victores. 1557.   | 26. |
| Speculum unitatis: sine Apologia pro Fratre Rogerio Barchone Anglo: in qua docetur nihil illud per Demoniorum fecisse auxilia, sed philosophum fuisse maximum: naturaliterque & modis homini Christiano licitis, maximas fecisse res, quas indoctum solet vulgus in Demoniorum referre facinora — Anno — 1557. | 27. |
| De Annuli Astronomici multiplici vsu — lib. 2 — Anno, 1557.  | 28. |
| Trochilica Inuenta — lib. 2 — Anno — 1558.   | 29. |
| περί ἀνακτοκρατικῶν θεολογιῶν — lib. 3 — Anno — 1558.  | 30. |
| De tertia & præcipua Perspectiua parte, qua de Radium fractione tractat — libri — 3 — Anno — 1559.   | 31. |
| De itinere subterraneo — libri — 2 — Anno — 1560.  | 32. |
| De Triangulorum rectilineorum Areis — libri — 3 — demonstrati: ad excellentissimum Mathematicum Petrum Nonium conscripti — Anno — 1560.  | 33. |
| Cabala Hebraica compendiosa tabella — Anno — 1562.   | 34. |
| Reipublica Britannica Synopsis: in English — Anno. 1565.   | 35. |
| De Trigono Circinòque Analogico, Opusculum, Mathematicum & Mechanicum — libri — 4 — Anno — 1565.   | 36. |
| De stella admiranda, in Cassiopea Asterismo, calius demissa ad orbem vsque veneris: iterumque in Cali penultima perpendiculariter retracta, post decimum sextum sue apparitionis mensem — Anno — 1573.   | 37. |
| Hipparchus Redinius — Tractatulus — Anno, 1573.  | 38. |
| De unico Mago, & triplici Herode, eoque Antichristiano. Anno — 1570.   | 39. |
| Ten sundry and very rare Heraldical Blasfonings of one Crest   | 40. |

B

or



*A Letter*

- or Cognissance, lawfully confirmed to certaine auncient  
Armes—lib. 1.—Anno—1574.
41. *Atlantidis, (vulgariter, India Occidentalis nominata) e-*  
*mendatio descriptio Hydrographica, quam vlla alia ad-*  
*huc euulgata*—anno—1580.
42. *De modo Euangelij Iesu Christi publicandi, propagandi, fla-*  
*biliendique, inter Infideles Atlanticos: volumen magnum,*  
*libris distinctum quatuor: quoru primus ad Serenissimam*  
*nostram Potentissimamque Reginam Elizabetham inscri-*  
*batur: Secundus, ad summos priuati sue sacre Maiestatis*  
*consilij senatores: Tertius, ad Hispaniarum Regem, Phi-*  
*lippum: Quartus, ad Pontificem Romanum*—anno 1581.
43. *Nauigationis ad Cathayum per Septentrionalia Scythia &*  
*Tartaria litora, Delineatio Hydrographica: Arthuro*  
*Pit, & Carolo Iackmanno Anglis, versus illas partes Na-*  
*nigaturis, in manus traditaz, cum admirandarum quarun-*  
*dam Insularum annotatione, in illis subpolaribus parti-*  
*bis iacentium*—anno—1580.
44. *Hemispherij Borealis Geographica, atque Hydrographica de-*  
*scriptio: longe a vulgatis chartis diuersa: Anglis quibus-*  
*dam, versus Atlantidis Septentrionalia litora, nauigatio-*  
*nem instituentibus, dono data*—anno—1583.
45. *The Originals, and chiefe points, of our auncient Brytish Hi-*  
*stories, discoursed vpon, and examined*—anno—1583.
46. *An aduise & discourse about the Reformation of the vulgar*  
*Julian yeere—written by her Maiesties commandement,*  
*and the Lords of the priuy Counsaile*—anno—1582.
47. *Certaine considerations, and conferrings together, of these*  
*three sentences, (aunciently accounted as Oracles) Nescite*  
*ipsum: Homo Homini Deus: Homo Homini Lupus.* 1592
48. *De hominis Corpore, Spiritu, & Anima: siue Microscopicum*  
*totius Philosophiæ Naturalis Compendium—lib. 1.—1591*  
With

*Apologeticall.*

With many other bookes, pamphlets, discourses, in-  
tentions, and conclusions, in diuers Artes and matters:  
whose names, need not in this Abstract to be notified: The  
most part of all which, here specified, lie heere before your  
Honours vpon the table, on your left hand. But by other  
bookes and writings, of an other sort, (if it so please God,  
and that he wil grant me life, health, and due maintenance  
thereto, for some ten or twelue yeares next ensuing) I may,  
hereafter make plaine, and without doubt, this sentence to  
be true, *Plura latent, quam patent.*

Thus far (my good Lord) haue I set downe this *Cata-*  
*logus*, out of the foresaid sixt Chapter, of the booke, whose  
title is this:

*The Compendious rehearfall of Iohn Dee, his dutifull decla-*  
*ration and prooffe of the course and race of his studious life,*  
*for the space of halfe an hundred yeeres, now (by Gods fauor*  
*and helpe) fully spent, &c.*

To which compendious rehearfall, doth now belong an  
*Appendix*, of these two last yeeres: In which I haue had ma-  
ny iust occasions, to confesse, that *Homo Homini Deus*, and  
*Homo Homini Lupus*, was and is an Argumēt, worthy of the  
decyphering, & large discussing: as may, one day, hereafter  
(by Gods helpe) be published, in some maner very strange.  
And besides all the rehearfed books, & treatises of my writ-  
ting, or handling hitherto, I haue iust cause, lately giuen me  
to write & publish a Treatise, with Title, *De Horizonte Ae-*  
*ternitatis*: to make euident, that one *Andreas Libanius*, in  
a booke of his, printed the last yeere, hath vnduly conside-  
red a phrase of my *Monas Hieroglyphica*: to his milking:

B 2

49

50.

by

*A Letter*

by his own vnskilfulnes in such matter: and not vnderstan-  
ding my apt application thereof, in one of the very princi-  
pal places, of the whole book. And

It may now be here also re-  
membered, that almost three  
yeeres after the writing of  
this letter, I did somewhat  
satisfie the request of an hono-  
rable friend in Court, by see-  
ding penning some matter  
concerning her maiesties Sea-  
foueraignie: vnder this title

51. *Thalassocrasia Brytannica.*  
*Siue,*  
*De Brytanico Maris Imperio,*  
*Collegata Extemporanea: 4.*  
*diertum Spacio, caleri conscripta*  
*calame. Anno, 1597.—Sep-*  
*temb. 20. Manchestria.*
1. *tled, De Horizonte: liber Mathe-*  
*maticus & Physicus. The Secod, De*  
*Aeternitate: liber Theologicus,*  
*Metaphysicus & Mathematicus.*  
2. *The Third, De Horizonte Aeter-*  
*nitatis: liber Theologicus, Mathe-*  
3. *maticus, & Hierotechnicus.*

¶ Truly I haue great cause to praise and thanke God,  
for your graces verie charitable vsing of me: both in sun-  
dry points else, & also in your fauorable yelding to, yea &  
notifying the due meanes for the performance of her Sa-  
cred Maiesties most gracious and bountifull disposition,  
resolution, and very royall beginning, to restore and giue  
vnto me (her Ancient faithfull seruant) some due mainte-  
nance: to leade the rest of my old daies, in some quiet and  
comfort: with habilitie, to retaine some speedy, faire, and  
Orthographicall writers, about me; and the same skilfull  
in Latine and Greeke (at the least:) as well for mine owne  
bookes, and workes, faire and correctly to be written (such  
I meane, as either her most excellent Maiestie, out of the  
premisses will make choise of, or command to be finished  
or published: or such of them, as your grace shall thinke  
meete

*Apologeticall.*

meete or worthy for my farther labor to be bestowed on:)  
as else for the speedy, faire, and true writing out of other  
ancient Authors their good and rare workes, in greeke or  
Latine: which by Gods prouidence, haue been preserued  
fro the spoile made of my Librarie, & of all my moueable  
goods here: &c. Anno. 1583. ✱ Although that my last  
voyage beyond y Seas, was  
duly vndertake (by her Ma-  
iesties good fauour and li-  
cence) as by the same words  
may appeare in the Letter,  
written by the right honou-  
rable Lord Threasorer, vnto  
your grace in my behalfe,  
and her most excellent ma-  
iestie willing his honor to  
do. Anno. 1590, the 20. of  
Ianuarie.

In which Librarie, were about  
4000 bookes: whereof, 700. were  
anciently written by hande: Some  
in Greeke, some in Latine, some in  
Hebrue: And some in other lan-  
guages (as may by the whole *Cata-*  
*logus* thereof appeare.) But the  
great losses and dammages which  
in sundry sorts I haue sustained, do not so much grieue my  
hart, as the rash, lewde, fond, and most vntrue fables and  
reports of me, and my studies philosophicall, haue done,  
& yet do: which comonly, after their first hatching, and  
diuelish deuising, immediatly with great speede, are gene-  
rally all the Realme ouerspread; and to some, seeme true;  
to other, they are doubtfull: and to only the wise, modest,  
discreet, godly, and charitable (and chiefe lie to such as  
haue some acquaintance with me) they appeare, and are  
knowne to be fables, vntruths, and vterly false reports, and  
sclaunders. Well, this shall be my last charitable giuing  
of warning, and feruent protestation to my Countymen  
and all other in this case:

*Before the Almighty our God, and your Lordships good*  
*grace, this day, on the perill of my soules damnation (if I lie, or*  
*take his name in vaine herein) I take the same God, to be my*  
*witnesse,*

B 3

A seruente  
protestatio.



### A Letter

witnesse; That, with all my hart, with all my soule, with all my strength, power, and understanding (according to the measure thereof, which the Almighty hath giuen me) for the most part of the time, from my youth hitherto, I haue vsed, and still vse, good, lawfull, honest, christian, and diuinely prescribed meanes, to attaine to the knowledge of those truthe, which are meet, and necessary for me to know; and wherewith to do his diuine Maiesty such seruice, as hee hath, doth, and will call me vnto, during this my life: for his honor and glory aduancing, and for the benefit, and commoditie publique of this kingdom; so much, as by the will, and purpose of God, shall lie in my skill, and habilitie to performe: as a true, faithfull, and most sincerely dutifull seruant, to our most gracious and incomparable Queene Elizabeth, and as a very comfortable fellow-member of the body politique, gouerned vnder the scepter Royall of our earthly Supream head (Queene Elizabeth) and as a liuely sympathicall, and true symmetricall fellow-member, of that holy and mysticall body, Catholicklie extended and placed (wherefoerer) on the earth in the view, knowledge, direction, protection, illumination, and consolation of the Almighty, most blessed, most holy, most glorious, conaistickall, coeternall, and coessentiall Trinity: The head of that body, being only our Redemer, Christ Iesus, perfect God and perfect man: whose returne in glory, we faithfully await, and daily, do very earnestly cry vnto him, to hasten his second comming, for his electes sake: iniquity doth so on this earth, abound, and preuaile, and true faith with charity, and Euangelicall simplicity, haue but colde, slender, and vncertaine intertainment, among the worldly-wise men of this worlde.

Therefore (herein concluding) I beseech the Almighty God, most abundantly to increase and confirme your graces heavenly

### A Letter

fully (though most briefly and speedily) to haue warned or confounded the scornfull, the malicious, the proud, and the rash in their vntue reports, opinions, and fables of my studies, or exercises Philosophicall: but that, it is of more importance, that the godly, the honest, the modest, the discreet, graue, and charitable Christians (English or other,) louers of Iustice, truth, and good learning, may, hereby, receiue certaine comfort in themselves (to perceiue, that *Veritas tandem praualebit*) and sufficiently be weaponed and armed with sound truth, to defende me against such kinde of my aduersaries: if hereafter they will begin afresh, or hould on, obstinately, in their former errors, vaine imaginations, false reportes, and most vngodly scandlers of me and my studies. ¶ Therefore, (to make all this cause, for euer, before God and man, out of all doubt:) Seeing, your Lordships good grace, are, as it were, our high Priest, and chiefe Ecclesiasticall minister, (vnder our most dread and Soueraigne Ladie, Queene Elizabeth) to whose censure and iudgement, I submit all my studies and exercises; yea all my bookes, past, present and hereafter to be written, by me (of my own skill, iudgement, or opinion,) I do, at this present time, most humbly, sincerelie, and vnfainedly, and in the name of Almighty God, (yea for his honor and glory) request, and beseech your Grace, (when, and as conueniently you may) to be well and throughlie certified of me, what I am, *Intus & in cute: Reuerendissime in Christo Pater, & Dignissime Archipræsul, cognosce & agnosce vultum tam internum, quam externum pecoris tui:* And wherein I haue vsed, doe or shall vse, pen, speech, or conuersation, otherwise

### Apologeticall.

heavenly wisdom, and endue you with all the rest of his heavenly gifts, for the relieuing, refreshing, and comforting, both bodily and spiritually, his little flocke of the faithfull, yet militant here on earth. Amen.

### An Epilogue.

Good my Lord, I beseech your grace, to allowe of my plaine and comfortable Epilogus, for this matter at this time. Seeing, my studious exercises, and conuersation 1. ciuile, may be abundantly testified, to my good credit, in the most partes of all Christendome: and that, by all degrees of Nobility, by al degrees of the learned, and by very many other, of godly and Christian disposition, for the space of 46. yeeres triall: (as appeareth by the Records lately viewed by two honourable witnesses, by Commission from her Maiesty,) And seeing, for these 36. yeeres, last 2. past, I haue bene her most excellent Maiesties very true, faithfull, and dutifull seruant; At whose royall mouth, I neuer receiued any one word of reproch; but all of fauor, and grace: In whose princely countenance, I neuer perceiued frowne toward me, or discontented regard, or view on me: but at all times fauorable, and gracious: to the great 3. ioy and comfort of my true, faithfull, and loyall hart. And (thirdly) Seeing, the workes of my handes, and wordes of my mouth (heere before notified, in the Schedule of my bookes, and writings) may beare liuely witnesse of the thoughts of my hart, and inclination of my minde, generally, (as all wise men do know, and Christ himselfe doth auouch) It might, in manner, seeme needlesse, thus carefully

### Apologeticall.

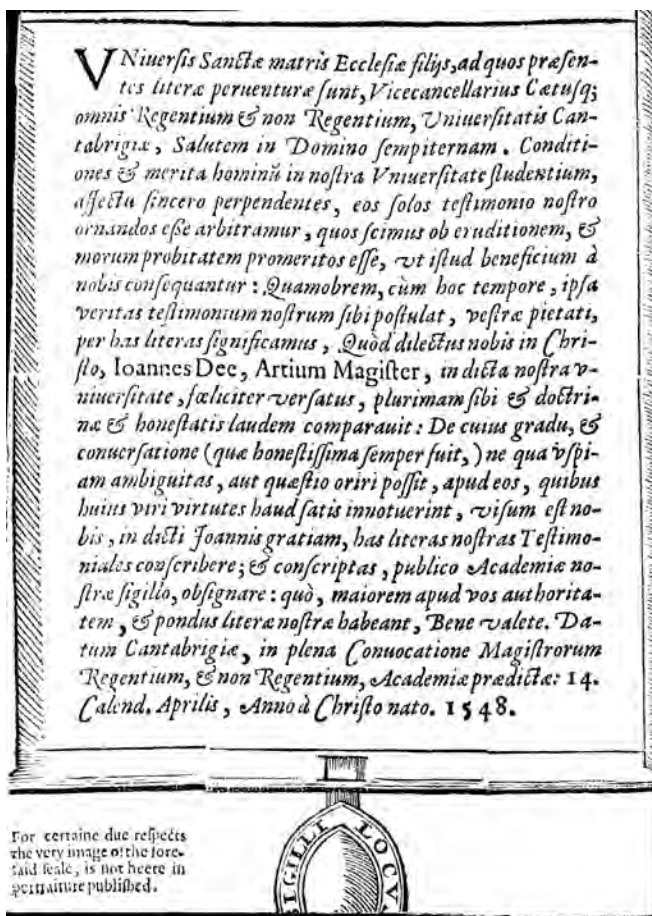
otherwise then as it appertaineth to a faithfull, carefull, sincere, and humble seruant of Christ Iesu, That your grace woulde vouchsafe to aduertise me. So, I trust, *Vltima respondebunt primis*: in such sort, as this *Authenticke Recorde* in latine annexed (*ad perpetuam rei memoriam*) doth testifie: hauing neuer, hitherto, had occasion to shewe that, in any place of Christendome: to testifie better of me, then they had prooffe of me, themselves, by my conuersation among them. (The Almighty, therefore, be highly thanked, praised, honored, and glorified, for euer and euer, Amen.)

But now, in respect of the generall intent of this briefe discourse, I most humbly, and reuerently, exhibit to your graces view, and perusing, the originall monument, and Authentick Record, before mentioned, faire written in parchment, with the seale whole, and perfect, duly appendant: as I haue 46. yeeres, and somewhat longer, preferred it. The true copy whereof, your grace doth see, to be *verbatim*, as followeth.

C

Vniuersis





## Apologeticall.

### Peroratio.

**T**He Almighty and moſt mercifull God the Father;  
for his only Sonne (our Redeemer) Ieſus Chriſt his  
ſake: by his holy ſpirit, ſo direct, bleſſe, and proſper all  
my ſtudies, and exerciſes Philoſophicall, (yea, all my  
thoughts, words, and deedes) henceforward, euen to the  
very moment of my departing from this world, That I  
may euidently and abundantly be found, and vndoubt-  
edly acknowledged of the wiſe and iuſt, to haue beene a  
zealous and faithfull ſtudent in the Schoole of Charity, and  
an Ancient Graduate in the Schoole of Charity: to the  
honor and glory of the ſame God Almighty, and to the  
ſound cōfort and confirming of ſuch as faithfully loue &  
feare his diuine Maieſtie, and vnfeinedly continue in la-  
bor to do good, on earth: when, while, to whome, and  
as they may, Amen.

Very ſpeedily written, this twelfth euen,  
and twelfth day, in my poore Cottage, at  
Mortlake: Anno. 1595. corrente à Nati-  
uitate Chriſti: aſt, An. 1594. Completo, à  
Conceptione eiſdem, cum nouem præterea  
menſibus, Completis.

Allwaies, and very dutifully,  
at your Graces commandement:

John Dec.



AT LONDON  
Printed by Peter Short, dwelling on Bred-  
ſtreete hill at the ſigne of  
the Starre.

A LETTER,  
Containing a most brief Discourse Apo-  
logetical, with a plain Demonstration, and fervent  
Protestation for the lawful, sincere, very faithful and  
Christian course, of the Philosophical studies and exercises,  
of a certain studious Gentleman: An ancient  
servant to her most excellent  
Royal Majesty

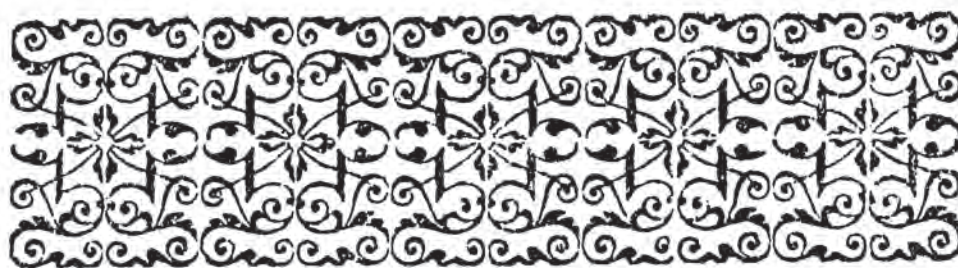
But I prayed for them. Psalm 109



Instead of loving me, they accuse me,

[Dee is kneeling in a burning cauldron of Hope, Humility and Patience.  
His is reciting the prayer Stephen made after he had been cast out of the city and stoned (from Acts 7:60.)  
Up in the clouds are God's all-hearing ear, his all-seeing eye, and his Sword of Justice.  
The many-headed beast is comprised of Dee's accusers and the rumor mill of the vulgar crowd.]





To the most Reverend father in God,  
the Lord Archbishop of Canturbury,  
Primate and Metropolitaine of all England,  
one of her Majesties most honorable privy Council,  
and my singular good Lord.



ost humbly and heartily I crave your Grace's pardon if I offend any thing to  
send or present unto your Grace's hand such a simple discourse as this is.

In light of my petition to her most excellent Royal Majesty, our  
Lordship's Good Grace, and other honorable good Lords of the Privy  
Council, my sage and discreet friends though it not be impertinent for me  
to explain some of my studies and studious exercises for the past 46 years.

Second, permit this to come to public new, not just to stop the  
mouths and stop the impudent attempts of the rash, and malicious devis-  
ers and contrivers of untrue, foolish, and wicked reports and fables concerning my studies, made  
with great (yea, incredible) pains, travels, cares and costs in the pursuit of true Philosophy.

Let this serve to certify and satisfy the judgement of the godly and impartial Christian  
hearer or reader to be sufficiently persuaded that I have wonderfully labored to find, follow, use  
and haunt the true, straight and most narrow path leading all true devout, zealous, faithful and  
constant Christian students.

*(from this valley of misery and the valleys of that misery,  
and from the kingdom of shadows and from the shadows of that kingdom  
to the holy Mt. Sion and to the heavenly tabernacles)*

All thanks are most due to the Almighty, as it so pleased him (even from my youth, by his  
divine favor, grace and help) to introduce into my heart an insatiable zeal and desire to know his  
truth.

And in him, and by him, unceasingly to seek and listen to the same, by true philosophi-  
cal method and harmony; proceeding and ascending (as it were) *gradation* [by steps] from visible  
things, to consider invisible things; from bodily things, to consider spiritual things; from transi-  
tory and momentary things, to meditate on permanent things; by mortal things (visible and invis-  
ible) to perceive immortality.

And to conclude, by the most marvelous frame of the whole world, viewed philosophi-  
cally, and circumspectly weighed, numbered, and measured (according to the talent and gift of  
God for effecting all this for his divine purpose) most faithfully to love, honor and glorify always  
the Framers and Creator of it all.

In his workmanship, infinite goodness unsearchable wisdom and almighty power, yea, his everlasting\* power and divinity may (by innumerable means) be manifested and demonstrated.

\* Paul to the Romans, Chapter 1, verses 19, 20.

The truth, of which my zealous, careful and constant intent and endeavor is specified here, may (I hope) easily appear by the whole, full and due survey and consideration of all the Books, Treatises, and discourses, whose Titles are annexed here. They have also been set down in the sixth Chapter of another little Rhapsodical Treatise entitled the *Compendious Rehearsal*.

It was written over two years ago for two honorable Commissioners which her most excellent Majesty sent to my poor Cottage in Mortlake to understand the causes of matter in full. At that time I had been urged to provide her Majesty's honorable Surveyor the proof of the contents of my most humble and pitiful supplication, which had been exhibited to her at Hampton Court on November 9, 1592.

Here is the contents of that sixth Chapter:

My labors and pains have been bestowed at diverse times to please my native Country by writing sundry Books and Treatises. Some are in Latin, some in English and some of them were written at her Majesty's commandment.

Some of the Books and Treatises were never printed.

**The following are Books and Treatises that were printed:**

1. ***Propaedeumata Aphoristica***

On the most superior virtues of Nature, 120 Aphorisms. (Year 1558)

2. ***Monas Hieroglyphica***

Mathematically and Anagogically [spiritually] explained to Maximillian, most wise King of the Romans, Bohemia, and Hungary. (Year 1564)

3. ***Letter to the Most Excellent Mathematician Frederico Commandino of Urbana***, prefixed to a small book by Mohammed of Baghdad entitled *On The Division of Surfaces*. [which wastranslated by Commandino of Urbana and published in Pisa]. (Year 1570)

4. ***The British Monarchy*** (otherwise called ***The Petty Royal Navy***) for political security, abundant wealth and the triumphant state of this kingdom (with God's favor). (Year 1576)

5. ***My Mathematical Preface, annexed to Euclid*** (for the first time published in the English Language by the right worshipful Sir Henry Billingsley, Knight, ) written at the earnest request of sundry right worshipful knights; and other learned men. Wherein are many Arts wholly invented by me (their names, definitions, properties, and uses). This is more than any Greek or Roman Mathematician has left for our knowledge. (Year 1570)

6. ***My diverse and many Annotations and Mathematical Inventions***, added in sundry places to the tenth Book of the aforementioned Euclid.

7. *Letter prefixed to the Ephemeris of the Englishman John Field.*

8. *Commentary on the Reasons for Parallax.* (Year 1573)

**These are the unprinted Books and Treatises (some complete, some unfinished).**

9. The first great volume of *Famous and Rich Discoveries* which includes:

The History of King Solomon (all three years of his Phirian voyage).

The Original work of Presbyter John (of the first great Cham [Lordship] and his successors for many years following).

The description of diverse wonderful Islands in the North, Scythian, Tartarian and most other Northern Seas near and under the North Pole from 1200-year old Records and other diverse rarities. (Year 1576)

10. *The British Complement of the Perfect Art of Navigation.* A great volume containing Arithmetical Tables Gubernautic, for Navigation by the Paradoxal Compass (invented by me in 1557) and for Navigation by great Circles. (for longitudes and latitudes).

It takes into account the variation of the Compass to most easily and speedily find true direction (yea, if need be) within one minute of time and sometimes without sight of the Sun, Moon or any Star. Also many other new and needed inventions for Navigating at Sea. (Year 1576)

11. *Her Majesty's Royal Title to Many Foreign Countries, Kingdoms, and Provinces* (recorded with good testimony and sufficient proof) for Her Majesty's use and at her Majesty's commandment. On twelve vellum skins of parchment. (Year 1578)

12. *On Imperial Name, Authority and Power.* Dedicated to Her Majesty. (Year 1579)

13. *Prologue and Speech to the Parisians at the College of Rhemes on Euclid's Elements.* first and second book. (Year 1550)

14. *The Uses of the Celestial Globe.* for King Edward VI. (Year 1550)

15. *The Art of Logic.* in English. (Year 1547)

16. *The 13 Sophistical Fallacians* [arguments containing a fallacy], with their discoveries, written in English meter. (Year 1548)

17. *Planet Mercury in the Heavens.* 24 books, written at Louvain. (Year 1549)

18. *On the Clouds, Sun, Moon, Planets and Fixed Stars in the Heavens.* (Year 1551)



19. *300 Astrological Aphorisms*. (Year 1553)
20. *The True Cause and Account (not vulgar) of Floods and Ebbs* written at the request of the Right Honorable Lady Jane, Duchess of Northumberland. (Year 1553) [Jane Guilford Dudley]
21. *The Philosophical and Poetical Original Occasions of the Configurations and names of the heavenly Asterisines* [constellations] written at the request of the same Duchess. (Year 1553)
22. *The Astronomical and Logical Rules and Canons Used to Calculate the Ephemerides*. Describing other necessary accounts of heavenly motions. Written at the request and for the use of that excellent Mechanician, Master Richard Chancellor, for his final voyage to Muscovia [Moscow]. (Year 1553)
23. *De Acribologia Mathematica*  
a large volume of 16 books. [loosely translated as on "Precision in Mathematics"] (Year 1555)
24. *A Paradoxical Mechanical Invention* used to find a new way to delineate the Circumferences of Circles, with which other very rare problems are able to be thought out and completed (Year 1556)
25. *On Burning Mirrors*. (Year 1557)
26. *On Perspective*, as it pertains to Pictures. (Year 1557)
27. *The Mirror of Unity* An Apology for English Friar Roger Bacon, the Englishman, in which it is taught that that man did nothing by the aid of the Demons, but was the greatest philosopher, naturally, and by the ways allowed to a Christian man. He did the greatest things, but the unlearned mob is accustomed to attribute them to the evil deeds of Demons. (Year 1557)
28. *The Many Uses for the Astronomer's Ring*. Two books. (Year 1557)
29. *Inventive uses of Trochillica* [wheels and pulleys]. Two books. (Year 1558)
30. *Peri Anabibasmos Theologikon* [loosely translated as "The Theology of Ascendancy"]. Three books.(Year 1558)
31. *The Third and Most Excellent Part of Perspective, the Refraction of Rays*.Three books.(Year 1559)
32. *On Subterranean Tunnels*. Two books. (Year 1560)
33. *On Right Triangles*. Three Books describing a demonstration made by the most excellent Mathematician Pedro Nunes. (Year 1560)
34. *Compendious Table of Hebrew Cabala*. (Year 1562)

35. *A Synopsis of the British Republic*, in English. (Year 1565)
36. *On the Triangle and the Analogical Compass*. A Mathematical and Mechanical work. Four books. (Year 1565)
37. *An Unusual Star in the Constellation Cassiopia*. Concerning the amazing star in the constellation of Cassiopeia that appeared in the heavens. It was located in the sky next to the orb of Venus, then again drawn back into the inner areas perpendicularly, after the sixteenth month of its appearance. (Year 1573)
38. *A Renewing of a tract by Hipparchus*. (Year 1573)
39. *On one Mage and of Herod*. (Year 1570)
40. *Ten sundry and very rare Heraldical Blazonings of one Crest or Cognisance* (lawfully pertaining to certain ancient Arms). One book. (Year 1574)
41. *Atlantidis*: a correct water map of the West Indies [North America] (never published by anyone else). (Year 1580)
42. *The measure of the Evangelical Jesus Christ*. (Year 1581)
43. *Navigational maps to Cathay by Way of Northerly Regions, Scythia, and Tartar* for Arthur Pitt and Charles Jackman. (Year 1580)
44. *A Land and Water Map of the Northern Hemisphere* [polar projection]. (Year 1583)
45. *The Original and Chief Points of our Ancient British History*. Discussion and Examination. (Year 1583)
46. *An Advice and Discourse about the Reformation of the Vulgar Julian Year* written by her Majesty's commandment and the Lords of the Privy Council. (Year 1582)
47. *Certain considerations and conferrings of the three ancient sentences: Nosce Teipsum* [Know Thyself] , *Homo Homini Deus* [Man is a God to Man], *Homo Homini Lupus* [Man is a Wolf to Man]. (Year 1592)
48. *On Body, Soul, Spirit in the whole Microcosm of Natural Philosophy*. One book.(Year 1591)

With many other books, pamphlets, discourses, inventions  
and conclusions in diverse Arts and matters  
which need not be listed in this Abstract.

Those which I have listed are piled here before you (on your left hand side). But I will make plain other sorts of books and writings (if it so pleases God that he will grant me life, health, and due maintenance for the next ten or twelve years) and without a doubt show that this sentence is true: *Plura latent, Quam patent* [Slow, but steady].

**It should also be remembered that (three years after writing the Compendious Rehearsal) I satisfied the request of an honorable friend in the Court to specifically write about her majesty's Sovereignty of the Sea under the title:**

*Thalasttocratia Brittanica*

[British Sovereignty of the Sea]

**regarding Britain's Imperial right to the seas.**

*(collected without haste and written with swift pen in the space of 4 days, completed on September 20, 1597, in Manchester)*

Thus far (my good Lord) I have set down this Catalog of the aforementioned sixth Chapter of this book:

*The Compendious Rehearsal of John Dee, his dutiful declaration and proof of the course and race of his studious life, for the space of half of a hundred years, now, by God's (favor and help) fully spent etc.*

Here now is an Appendix to this Compendious Rehearsal regarding the past two years.

I have had many just occasions to confess that ***Homo Homini Deus*** [Man is a God to Man], and ***Homo Homini Lupus*** [Man is a Wolf to Man] was and is an Argument Worthy of deciphering and discussing at large. It may (by God's help) one day be published, in some very unusual way.

Besides all the books and treatises I have written, I have lately had reason to write and publish a Treatise entitled *On the Horizon of Eternity*. I have done so to make evident that Andreas Libavius (in one of his books printed last year) has unduly considered a phrase of my *Monas Hieroglyphica*, a mistake made because of his own unskillfulness in such matters, and not understanding my apt application of it in one of the principal places in the whole book.

[Dee only uses this expression in his "Thus the World Was Created" chart.]

This new book of mine (with God's help and favor)  
shall be dedicated to her most excellent Royal Majesty  
and will contain three books:

*On the Horizon*, a book on Mathematics and Physics

*On Eternity*, a Theological, Metaphysical, and Mathematical book.

*On the Horizon of Eternity*, a book on Theology, Mathematics and Hierotechnics [Sacred Art].

Truly I have great cause to praise and thank God for your grace's very charitable using of me, both in these sundry points and in others. And also for your favorable yielding to (yea, and notifying) the due means for the performance of her Sacred Majesty's most gracious and bountiful disposition, resolution, and very royal beginning to restore and give unto me (her Ancient faithful servant) some due maintenance.

Thus, I might lead the rest of my old days with some quiet and comfort, with the ability to retain some speedy, fair, and Orthographical [those who can spell correctly] writers about me who are skilled in Latin and Greek (at the very least).

And also so that my own books and works can be copied fairly and correctly (I mean those that her most Excellent Majesty may choose and command to be finished and published, or those your Grace shall think fit or worthy for my labor to be bestowed upon).



And also for the fair and true transcribing of other good and rare works of other Authors (in Greek or Latin), which by God's providence have been preserved after the spoiling of my Library and all my moveable good here in the Year 1583.

In my library there were about 4000 books, 700 of which were anciently written by hand (some in Greek, some in Latin and some in Hebrew, and some in other languages (as can be seen in my Catalog).

But the great losses and damages of various kinds that I have sustained do not grieve my heart as much as the rash, lewd, insipid, and most untrue fables and reports about me and my philosophical studies (those I have done and have yet to do).

Usually, after their first hatching and devilish devising, they immediately, with great speed, spread throughout the Realm.

Some believe them, some are doubtful, but the wise, modest, discreet, godly and charitable (and generally those who have some acquaintance with me) know they are fables, untruths, utterly false reports and slanders. Well, this shall be my last charitable warning and fervent protestation to my Countrymen (and all others).

**My last voyage beyond the Seas was duly undertaken (by her Majesty's good favor and license) as can be seen in the Letter written by the right honorable Lord Treasurer in my behalf, as her most excellent majesty willed his honor to do.**

***January 20, 1590.***

***[Dee concludes with a short invocation, an epilogue, and a peroratio (the finishing up of a speech)]***